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THE NATIONAL METALWORKING WEEKLY

March 30, 1950

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UNIV. OF MICHIGAN

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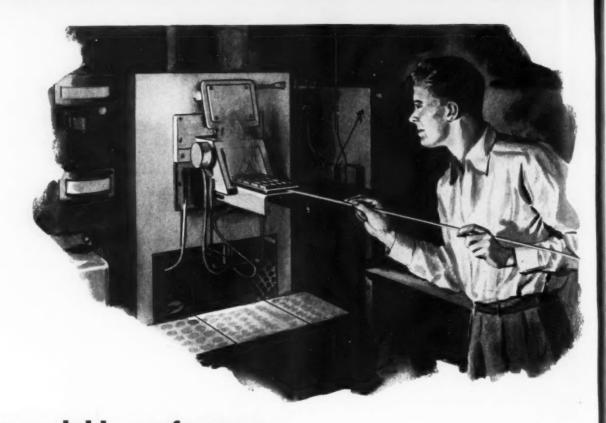
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WORTH STEEL COMPANY CLAYMONT, DELAWARE



Dependable performance year after year with Hoskins Chrome - equipped Electric Furnaces

There's nothing revolutionary about Hoskins Furnaces, but you'll find them hard to beat when it comes to delivering useful electric heat. And for good reason, too. Because every Hoskins Electric Furnace is equipped with durable CHROMEL heating elements. Long-lasting elements that possess close-to-constant "hot" resistance between 700° and 2000°F., that deliver full-rated power throughout their long and useful life. Dependable heating elements designed to give you uniform distribution of heat with maximum operating efficiency. Important, too, every CHROMEL element in every Hoskins furnace is formed in such a way as to permit quick and easy replacement.

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If you have a fastening problem where it looks as though a special could be used to good advantage, talk it over with us. We'll be glad to study the problem, and offer recommendations. To start the ball rolling, get in touch with the nearest Bethlehem sales office, or drop a line to us at Bethlehem, Pa.

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Chestnut and 56th Sts.
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THE IRON AGE

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MARCH 30, 1950 . . . VOL. 165, NO. 13

Special Issue



A Special Issue devoted to the ASTE Cost-Cutting Exposition in Philadelphia's Convention Hall, April 10 to 14 inclusive, is featured this week by THE IRON AGE. Cost-cutting hints are presented in articles covering the following topics: tool control; tool material standardization; heat treating; resistance welding; form cutting precision gears; and tool manufacturing for machine shops and die shops. Also included is a Tool Engineers Notebook of cost-cutting case histories.

Issue Highlights



A unified, plant-wide tool control program offers substantial savings in operations using carbide cutting tools. The Coordinated Carbide Control system in operation at the Worthington Pump & Machinery Corp., Harrison, N. J., plant has kept the cost of cutting tools at a minimum. The effectiveness of the plan comes from: (1) Plant-wide tool standardization; and (2) fabrication and maintenance of all tools at a central point.—p. 86.



The Tool Engineers Notebook of cost-cutting case histories presents actual plant applications of new tools, fixtures, cutting compounds, and methods that have cut costs and saved time. It is packed with ideas that can be profitably used in many a shop.—p. 92.



Plans are afoot for a tremendous expansion of primary aluminum capacity in North America. Aluminum Co. of Canada is now working out plans for a huge new ingot plant and power development in British Columbia, while Aluminum Co. of America has acquired property at Skagway, Alaska and at nearby Dyea where new capacity may eventually be built.—p. 109.



The Senate-House Economic Committee has branded the steel price rise in December as "untimely and unwarranted." But the committee minority charges this is the result of "unreasonable bias."—p. 111.



Climax Molybdenum Co. is building a vacuum arc-melting furnace for experimental production of 1000-lb molybdenum ingots. The company now produces—experimentally—200-lb ingots. The metal can be forged and rolled; Machining and grinding are practical. One goal is to tap the high temperature field.—p. 117.

Coming Next Week



Through inert atmosphere welding and annealing processes, titanium, the newest and most virile metal is now available in tubing. In spite of its light weight, properties of titanium tubing compare favorably with carbon and some types of stainless steels.

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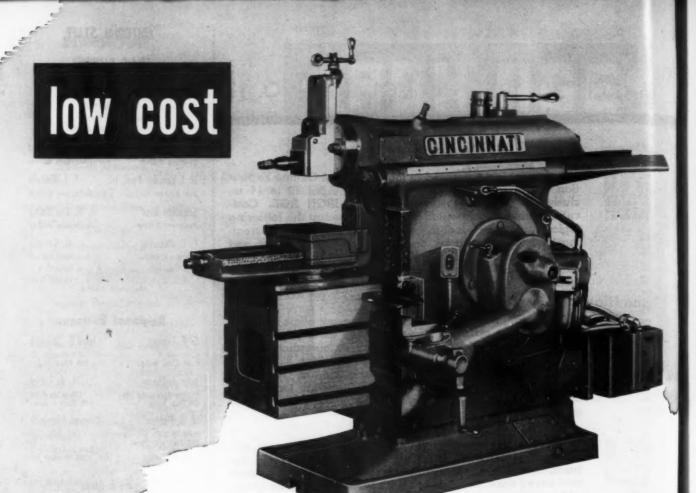
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Indexed in the Industrial Arts Index and the Engineering Index. Published every Thursday by the CHILTON CO. (INC.), Chestnut and 56th Sts., Philadelphia 39, Pa. Entered as second class matter Nov. 8, 1932, at the Post Office at Philadelphia under act of March 3, 1879. \$8 yearly in United States, its territories and Canada; other Western Hemisphere Countries \$15; other Foreign Countries \$25 per year. Single Copies 35¢. Annual Review Number, \$2.00.

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The Utility model, equipped with the Universal Table, carries all the advantages of the Universal Shaper and makes an ideal tool for the tool room. It embodies all the other characteristics and conveniences of Cincinnati Shapers with the exception of Power Rapid Traverse. This feature may be added if desired.



Cincinnati Utility Shaper



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Editorial

NDUSTRY VIEWPOINTS

Cost Cutting Experts

OSTS are cut to increase the sale of products and make a profit for the company, wages for the employees and taxes for the government. That's the way it used to be.

Now we have to cut costs so we can pay for shorter work weeks, sick benefits, pensions, ever higher taxes and get a bigger volume of sales. The last is important. If prices go too high the buyer starts hedging. If they are too low the company goes broke.

Someone has to stay awake nights worrying about these things. It is true that top level management has its share of headaches and nightmares. But there is another type of fellow who never seems to have a moment's rest in the 24 hours.

His wife raves at him because he doesn't get that leak mended; or that window fixed; or that train track rearranged; or why doesn't he even have time to sharpen the knife so he can cut the meat.

Then his children want to know why he can't play with them. Why he can't help them with their algebra. Why he can't get out there and bang the ball around.

Who is this fellow and why is he in the dog house at home a lot of the time? He is the tool engineer.

The tool engineer is the fellow who may help design the product and must recommend the right methods and the right machine to put the product out at the cheapest price he can.

He may be at the top of the outfit or he may be on his way up. But one thing is sure about him: He has to know about the best way to make the best product—the right tools, the right sequence, the right cycle and he'd better make no mistake about it.

We sing this fellow's praise because all too often he is forgotten when the back slaps are handed out. From Apr. 10th through the 14th in Philadelphia he is going to have his day. Mark this on your calendar. It is the Industrial Cost-Cutting Exposition of the American Society of Tool Engineers, Convention Hall, Philadelphia.

If you get the chance, be there. The tool engineers will be there and they will have plenty to tell you about how to cut costs. Whether you know it or not the next 10 years are going to require one of the biggest periods of cost cutting that we have seen since the industrial revolution.

Tom C. Campbeel

Editor



M



The Sterling Bolt Man is rarin' to go, eager and able to supply you with standard or special metal fastenings—In package or bulk quantities, in brass and steel, including stainless.

Sterling Bolt offers you dependable single-source service for all your metal fastening requirements—service that simplifies your purchasing problems and saves you time and money. Place your metal fastening orders with us for prompt, personalized attention—for delivery of the right fastener at the right time.

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Fatigue Cracks

By Charles T. Post

Aluminum-Steel Team

This is about the war between Man and The Birds. Jeff Chaucer is our authority for reporting that birds—or certain of their habits—have long been a disturbing problem to man. Unlike cats, birds can't be house-broken.

The menace has been periodically attacked in Washington by the full might of the Government but the birds have always won. They are still in complete command there. We have that straight from Gene Hardy, our chief Washington ear. He phoned us some unprintable remarks by way of proof that so far the war between man and the starlings and the pigeons has not gone well for the citizenry.

But there's new hope from the West where Kaiser Aluminum has teamed up with Bethlehem Pacific Coast Steel to develop what may be the winning weapon. The Bureau of Reclamation says that birds are unwelcome on its power lines; no sooner are new towers erected than feathered friends swoop down on the crossarms to pass the time of day. This tends to short circuit the wires and Bureau men blow fuses.

Now Bethlehem Pacific is making sharply spiked bird guards of Kaiser aluminum. Their jagged teeth are fastened in sets on power tower crossarms to make them uncomfortable for birds. With each set of teeth the Bureau also includes a strategically located aluminum pan. Apparently recalling home office experience, the Reclamation people were taking no chances on the spikes doing the whole job.

This may revolutionize part of the Washington scene. It may put a lot of hat cleaners out of business there, too. But still there's the question: Who climbs up to empty the pans?

Puzzlers

E. A. Bostrom, Pope Trading Corp., New York, sends us one that reminds us of the days of Barney Oldfield: A racing car goes half-way around a circular 1-mile track averaging 30 mph. How fast must it travel around the second half to average 60 mph for the lap?

We worked on that for a bit and came to the conclusion that E. A. has a vested interest in a rocket business. If he'll give us a mile, and settle for an average of, say, 59 mph, we might get an answer. But the question is, "Who'll drive the car at that speed?" What speed? Well, we haven't quite figured that out yet but we've already passed the transonic barrier.

Mr. Jackson's sheet of paper puzzle (Mar. 9) has produced a couple of suspiciously accurate "guesses," and not a few questions on where he found paper big enough for the job. H. Kelsea Moore from down Boston way mentions that tearing it 50 times would make a stack of 17,769,886.36 miles high. This is quite close to the 17,769,885+ miles sent in with the original problem by reader Jackson; so close that we don't think you could tell the difference at that altitude. Reader Fickes, who gets his experience making tanks in Buffalo, was almost on the nose, too, but reader Hopkins who apparently guessed (like it said to do in the rules) was off by a few million miles.

valves are gasket mounted to sim. machine appearance.

Power Unit having pump driven by standby gasoline engine

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Illustrated here are representative examples of the infinite variety of self-contained hydraulic power Units that are designed and built by Vickers for the more efficient operation of many kinds of machinery. These compact Units include all necessary pumps, valves, intermediate piping, reservoir, hydraulic accessories, motors and controls. Hydraulic connections to the machine are grouped in a convenient manifold.

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Associate Prof. Materials Engineering Syracuse University East Syracuse, N. Y.

TUBING

In the issue of July 28, 1949 we read an article on the subject of producing tubing by welding coiled strip. We want to know the name of the manufacturer of the equipment for making L. M. BOUGHTON
Purchasing Dept.
Monterrey, Mexico

The equipment described in the article concerning the manufacture of welded tubing from coiled strip was developed by the B & M Mfg. Co. for its own use. Therefore, it is not available through any other manufacturer. However, there are two other firms which do manufacture machinery for making which do manufacture machinery for making tubing from strip, although the product is buttwelded along a seam running the length of the tubing, rather than coiled. The manufacturers of this equipment are American Electric Fusion Corp., 2618 Diversey Ave., Chicago 47, Ill., and the Yoder Co., 550 Walworth Ave., Cleveland, Ohio.—Ed.

BROACHING MACHINE

On p. 137 of the Dec. 15, 1949 issue, we read an advertisement from Jones & Laughlin Steel Corp., on which appears a photo of making shock-absorbers at Houdaille-Hershey. As makers of telescopic shock-absorbers in Holland, we are looking for a single or multiple-spindle broaching machine of the model which appears on the abovementioned photo. This machine must be able to finish short tubes of shockabsorbers.

J. DE KONING

Koni Works Oosdijk, Holland

The broaching machine shown is a product of American Broach & Machine Co., Ann Arbor, Mich.—Ed.

COPPER PRODUCERS

In a recent issue of your magazine, in which you reported Mr. C. R. Cox being named President of the Kennecott Copper Corp., you referred to Kennecott as the world's largest producer of copper. This surprised me for I have thought and read many

times that while Kennecott was the largest producer of copper in the United States, that Anaconda Copper Mining was the largest producer on a world-wide basis when you took into consideration their South American holdings. Would you please advise which is correct.

C. R. RANDALL Pittaburgh

The relationship as you understand it was generally true a few years ago. However, in 1948, the latest year for which production figures are available, Kennecott and its subsidiaries produced 514,580 short tons of copper, while Anaconda and its subsidiaries produced 432,173 tons, on a worldwide basis.—Ed.

GERMAN ALLOY STEELS

We are regular subscribers to your magazine and we should be very grateful if you would assist us in the following matter. We are interested in an article on German alloy steels contained in your issue of Sept. 13, 1945. Could you possibly let us have a copy of this issue, or if it is not available, a reprint or copy of the article.

H. M. LEBRECHT Methods Enginee

J. Stead & Co., Ltd. Sheffield, England

Copy has been sent.—Ed.

TVA INQUIRY

We note on p. 86 of the Dec. 8 issue an article on the economics of tonnage steel melting in the electric furnace. Would you please be kind enough to send tear sheets of this article and earlier articles referred to therein, if available?

J. W. CADE
Power Supply Engineer
Chattanooga, Tennessee
Copies

SKELETON OR STAMPING?

Please give us your classification on a piece of steel which we call skele-tons. The material before being punched, comes in lengths 1/16 in. thick, 12 ft long and 161/2 in. wide. Blanks about 5% in. long and 16 in. wide are punched out. Blanks are so spaced that the skeleton left is about a ¼-in. strip between each blank. We are having difficulty with our customer; he calls it stampings and we say skeletons. We believe that what is punched out should be called stampings.

American Iron & Metal Co.

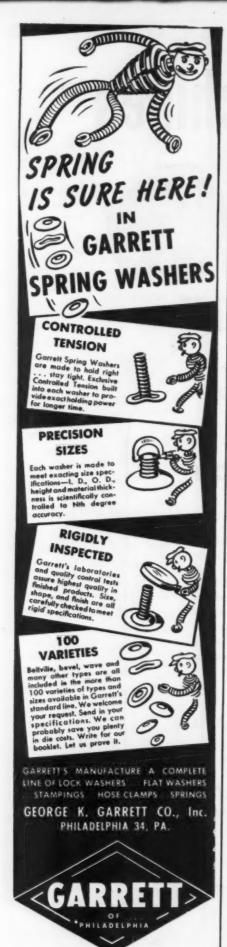
Erie, Pa.

The only specifications on scrap that THE IRON AGE uses are those put out by the government. These are Dept. of Commerce and OPA specifications, and can be found in the Institute of Scrap Iron and Steel yearbook. This is issued by the Institute of Scrap Iron and Steel, Inc., 1344 Connecticut Ave. N. W., Washington 6, D. C.—Ed.

A



AGE





TOOLING ISSUE—This is the big one. Every feature article devoted to the problems of production tooling, and what it can mean in factory operations. Here on The Iron Age we have been holding our breath. The last time we had such an issue ready, we found that our printing plant was on strike, and instead of publishing a 300-odd page issue, we published one that only contained 8 pages.

All in all it was a harrowing experience—back in March of 1948, and we don't want to go through it again. If this column ever sees print, you will know that we did manage better in honor of this year's meeting of the American Society of Tool Engineers.

NEW PRODUCTS - While new production wrinkles are adequately taken care of elsewhere in THE IRON AGE, we can't pass up the opportunity to comment on a brief news item on a new shipping stunt being used by Kaiser-Frazer. It is a "pin-wheel" mounting arrangement developed jointly by the auto company and Union Pacific railroad engineers. Using this system. Kaiser-Frazer is shipping 16 auto bodies on a flat car from Willow Run to the firm's west coast assembly plant. It involves a trick mounting similar to revolving assembly fixtures used in manufacturing that permits one car to be loaded on the bottom, the mounting is turned over and another is attached to the other side. The Willow Run boys figure to save a lot of dough this way. You'll find the story and pictures on page 113 of this issue.

COATESVILLE, PA .- A featuretype story on the town of Coatesville, and the Lukens Steel Co., around which the town revolves is to be found on page 119. This company shows a proud record of enlightened community relations. As a firm that dominates the economy of the town in which it is located. good community relations isn't a new term used only in public relations circles. Instead, it is a description of what the firm has been doing in Coatesville for decades. All in all, it is what newspapermen in their jargon call a "good little yarn," which may be freely translated as a good writing job.

Can we call your attention to the dateline that is on that same article. It is a part of the constant traveling done by the editors of The Iron Age to give you a first hand account of what is going on in industry. They make a special effort to see that they call in the small towns as well as the large. They like to call in Coatesville, Pa., and Niles, Ohio, and when they go to Pittsburgh they go to Homestead and Aliquippa and Monessen as well.

does your product fit this picture ...

Take a good look at your product.

Does it fit the competitive picture?

Could rolled shapes or tubing simplify
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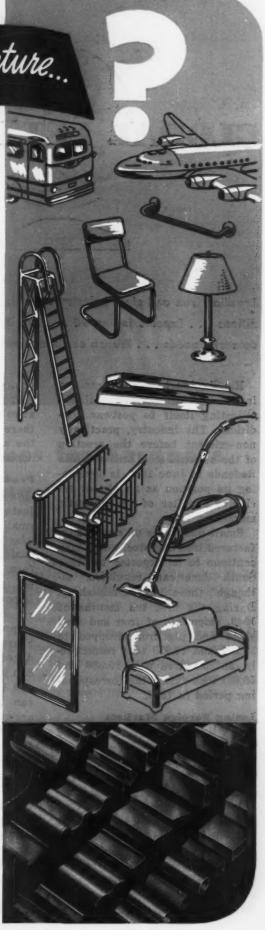
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March 30, 1950





REVIEW OF WORLD MARKETS

Brazilian iron and steel industry adjusting to postwar conditions . . . Exports falling off . . . Pig iron production fills domestic needs . . . French company converts facilities.

Rio de Janeiro—The Brazilian iron and steel industry is slowly adjusting itself to postwar conditions. The industry, practically non-existent before the erection of the national steel mill at Volta Redonda in June 1946, is developing its position as an almost exclusive supplier of the domestic market.

Small quantities of semi-manufactured iron and steel goods may continue to be exported to other South American republics, although these are diminishing. During the first ten months of 1949, shipments of iron and steel sheet and pig iron dropped to 12,271 and 10,970 tons respectively, as compared with 19,336 and 55,631 tons during the corresponding period in 1948.

Losing Foreign Markets

Manufacturing, encouraged by demands from abroad and virtual suspension of imports from 1939 to 1946, is now losing its foreign markets. Exports of finished products decreased from 5181 tons during the first ten months of 1948 to 3306 last year. In addition, it is faced with sharp competition from old established firms in North America and Europe, a competition it is at present unable to meet without some form of

protection. Production costs are rising because of increased salaries and social legislation so that there is little difference between the market price of imported and domestic goods.

Production Adjusted to Demand

Domestic production is being adjusted to meet the demands of a small but expanding market. Manufacturers are concentrating on quality, instead of quantity, and farm equipment, national cutlery, etc., compare more favorably with imported products. Manufacturers are also extending the range of production to meet local needs. Farm machinery is being produced in increasing quantities. A San Paulo firm is building tractors and equipping them with American motors. Several companies are making chassis for commercial vehicles. The National Motor Factory aims at monthly production of 100 trucks, made with Brazilian materials, including a 100-hp diesel motor. Other firms are increasing production of household electrical appliances.

Iron and steel products for these goods are being made in Brazil. Between 41 and 49 pct of the material is acquired from Volta Redonda. Present annual capacity of Volta Redonda calls for production of 300,000 tons of pig iron, 250,000 tons of steel ingots and 200,000 tons of rolled steel products. The plant was designed by Arthur McKee Corp. so that installations can be readily doubled.

The manufacture of bars, channels, steel sheet, tinplate and galvanized iron during 1949 all show increases over 1948 production of these items.

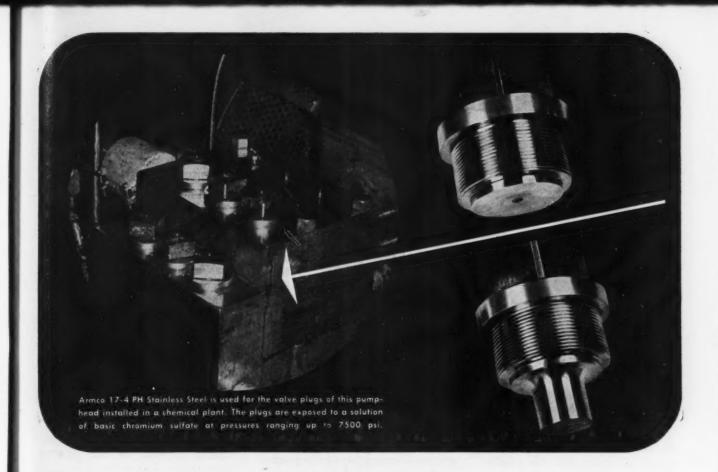
In Minas Geraes new furnaces installed recently can produce 60,000 tons of pig iron and 30,000 tons of steel annually. In San Paulo the Jafet interests are importing \$30 million worth of American equipment to increase iron and steel output. National production of pig iron is now slightly in excess of domestic needs, while imports of tinplate have dropped 28 pct.

French Firm Builds Tractors

The French company, Acieres du Nord, which for the past thirty years has specialized in the repair of locomotives, has converted its facilities at Haumont and L'Horme to the manufacture of tractors. Plant conversion is already completed and production of agricultural and industrial tractors is underway. A new tractor model of 130 hp, weighing 18.6 tons, has been developed recently. Production of the new tractor is expected to reach five units per month in September.

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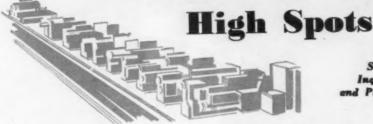
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MACHINE TOOL



Sales Inquiries and Production



Order backlogs are biggest since July of 1948 . . . More Ford tooling orders seen . . . Some prices raised.

Wiein A. Legg

Cleveland—Backlog of orders in the machine tool industry at the end of February was the biggest since July, 1948, according to a preliminary report of National Machine Tool Builders' Assn.

New order volume in February declined from the January level, highest since the fall of 1946, but was higher than February, 1949, the report showed.

Shipments increased over January, but were below February, 1949.

NMTBA's index of new orders for February was 88.7, compared with 99.7 in January, and 80.9 in February, 1949. Index of foreign orders, included in the total, was 18.8 in February, compared with 26.7 in January and 26.5 in February, 1949.

Backlogs Are Bigger

Index of shipments was 55.8 in February compared with 52.8 in January and 70.3 in February, 1949.

Ratio of unfilled orders to shipments was 5.9 to 1 at the end of February, compared with 5.7 to 1 at the end of January, and 4.7 to 1 at the end of February, 1949.

In Detroit the Chrysler strike continues to act as a brake on an otherwise active and optimistic machine tool market. Of course, in the background stands the possibility of a GM strike in June, which observers here have pointed out could happen if the discussion between the company and the union gets hung up. At the moment, the union is making a prominent issue of the union shop.

Other than fear of the backwash from labor problems, most machine tool suppliers here find themselves pleasantly occupied either preparing quotations for new tooling or attempting to speed up deliveries on equipment already on order.

Expect More Ford Orders

The Ford six-cylinder engine program is continuing as has been observed earlier in this column. Expectations that ordering for the Ford V-8 engine is coming soon are growing. Meanwhile, Ford is also active in the die casting field at Monroe, according to the trade. There have apparently been some construction delays in the Cincinnati transmission plant which have held deliveries there behind anticipated schedules.

The Chrysler strike continues to act as a damper on the company's new engine activity scheduled for the Jefferson plant. However, with the reduction of the negotiating teams on both sides to four men each, there is a strong feeling now that the Chrysler stoppage will be ended not later than Apr. 3. This is, of course, provided unexpected snags do not develop in the negotiations. The industry here is anticipating a busy time after Chrysler gets back in high gear on its proposed engine program.

Tool and Die Buying

A satisfying aspect of the present Detroit activity is the amount of buying reported by local tool and die shops. Most of the purchases have been made, it is indicated, by the larger tool and die establishments in this area. Although spotty, the volume has been nevertheless satisfying, according to supplier sources. New Panograph engraving machines have been a prominent item on these buying lists, according to the trade.

Some Prices Raised

In other sales sectors, a continuing interest on the part of users in new equipment is evident. despite the absence of a definite pattern of demand. As has been the case since the end of the war, some companies are getting business in substantial volume, but others are not. March is a seasonally high month for the machine tool industry, and sources in the trade expect that it will round out one of the biggest first quarters the industry has had since the machine tool market returned to something that passes for normalcy.

Elsewhere, a price increase of 10 pct on some models by a major machine tool builder has been reported by reliable sources in the trade. This follows a reported increase in the price of machine tool motors by one of the major producers of 7½ pct on main drive motors 5 hp and up.

Despite the immediate benefits of ECA, some export sales managers are beginning to wonder if long term effects will be in the machine tool industry's favor. Biggest weapon in combating price differentials of devaluation has been buying habits, some of which have been changed completely to European builders.

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PUBLICATIONS

Industrial Air Controls

Robotair industrial air controls are described in a 14-p. catalog showing selection charts and cutaway illustrations of various airactuated holding devices, gages and reservoirs. Bendix-Westinghouse Automotive Air Brake Co. For more information, check No. 1 on the postcard.

Boring Tools

Davis Super Micrometer stub boring tools, precise enough for finishing to 0.0001 in., are described in a new 4-p. illustrated folder, and a new 4-cutter type car wheel boring tool is shown on a data sheet. Davis Boring Tool Div., Giddings & Lewis Machine Tool Co. For more information, check No. 2 on the postcard.

Expanding Mandrels

Sizes and prices of Champion quick-change precision expanding mandrels are listed on a new data sheet. Western Tool & Mfg. Co., Inc. For more information, check No. 3 on the postcard.

Grinding Fixture

Motor and hand operating styles of the Hammond solid carbide insert grinding fixture are shown in bulletin No. 701. Hammond Machinery Builders, Inc. For more information, check No. 4 on the postcard.

Lift Trucks

How one small tool manufacturer saved \$2,440.40 with a single Towmotor LT-44 in handling 600 tons of electric sheet steel a year

New publications that describe money saving equipment and services are available free and without obligation. Copies can be obtained by filling in the attached card and mailing it.

is described in a 4-p. certified job study folder. Townotor Corp. For more information, check No. 5 on the postcard.

Magnetic Parallels

Scherr Magne-Blox parallels for speedy surface grinding setups are shown in an 8-p. booklet, which also describes magnetic V-blocks and toolmakers' angle iron. George Scherr Co., Inc. For more information, check No. 6 on the postcard.

Industrial Clutches

Engineering information, specifications, ratings and other application data of value for analysis of specific clutch problems are found in a new 34-p. booklet describing Airflex clutches and other Fawick power transmission products. Fawick Airflex Co., Inc. For more information, check No. 7 on the postcard.

Protective Coating

The EHW formula, which provides a protective coating for all metal and plated surfaces, is described on a 2-p. bulletin listing prices. Temperature Equipment Corp. For more information, check No. 8 on the postcard.

Boring and Grinding

The new Hauser 3-S high speed jig grinder, jig boring machines, optical checking and measuring apparatus, and special automatic machines for watchmaking and similar industries are described in a series of 3 illustrated catalogs. Hauser Machine Tool Corp. For more information, check No. 9 on the postcard.

Casting Impregnation

How to save porous ferrous or nonferrous castings at approximately 1¢ per lb, in large quantities, is told in a new bulletin. Approved Casting Impregnating Co. For more information, check No. 10 on the postcard.

Steam Turbine

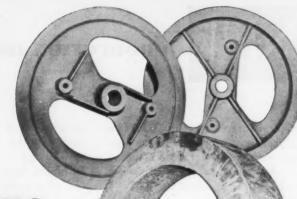
Complete description and specifications of the new De Laval CP turbine for high pressure service are presented in a 4-p. bulletin. De Laval Steam Turbine Co. For more information, check No. 11 on the postcard.

Journal Bearings

Dimensions and list prices of Orange journal roller bearings are given in a new 4-p. folder outlining

Turn to Page 177





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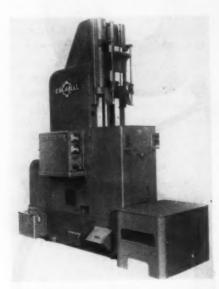
PRODUCTION IDEAS

Continued

ameter. Interchangeable blades facilitate cutting different size keyways with one tool. Kase Machine Co. For more information, check No. 36 on the postcard on p. 37.

Broaching Machines

Single and dual ram surface broaching machines, and pull-up and pull-down internal broaching machines have been redesigned to conform to the new Joint Industry Conference standards. Electric controls are group mounted in the single external dust-protected panel. Hydraulic controls are group mounted on the panel on the opposite side of the machine column. Motorized pumps are so located that they can be changed in approximately 1-hr time. Filters consist of replaceable cartridges ex-



ternally accessible. Various control units have been standardized for interchangeability and ease of maintenance and service. Colonial Broach Co. For more information, check No. 37 on the postcard on p. 37.

Jig Grinder

Any regular or irregular contour and straight and tapered holes can be ground quickly and accurately with the new No. 2 Model Moore jig grinder. A new angular and indexing device built into the main spindle and a new slot grinding attachment permits accurate grinding of any contour. More spindle power and infinite feeds up or down make chop grinding of contours possible. Grinding speeds range



from 12,000 to 60,000 rpm. Larger table size and height, coupled with greater power, extend the overall range of grinding operation. Moore Special Tool Co., Inc. For more information, check No. 38 on the postcard on p. 37.

Shear

Feeding and turning resistance are eliminated with the new Tru-Edge shear that is capable of cutting irregular shapes in mild or stainless steel sheets up to 3/16 in. thick. Attachment for circle cutting and strip cutting is provided and the shear may be used to cut to a scribed line or by template. No starting hole is required for inside cuts. With hammer dies instead of cutting tools, the machine will do beading and forming operations in steel up to 1/8 in. thick. Because the machine actually shears the metal, a perfectly

smooth, burr-free edge results. The shear has a 48-in. throat, a variable stroke adjustment, and is powered by a 1½ hp totally enclosed ball bearing motor 220/240 v, 3 phase, 60 cycle. The only moving parts



are one roll crank, two rollers, and reciprocating top tool holder. Baker Bros., Inc. For more information, check No. 39 on the postcard on p. 37.

Carbide Tool Grinder

A new bench-type, universal carbide tool grinder designed for use with diamond wheels can be used as a surface grinder, a chip breaker grinder, and a universal tool and cutter grinder. This machine is provided with swiveling table and swiveling motor with micro setting scales for accurate



grinding and resharpening of cutters, reamers, counterbores, etc. Grinding wheels are mounted directly on the 1½ in. ball bearing spindle or on either of two adapters that give spindle extensions of 2½

Turn to Page 182

Iron Age The Introduces



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WILLIAM E. CLARK, general manager, engineering works division, Dravo Corp.



CARL W. SCHAFFNER, superintendent, grey and white iron foundries, Sprout, Waldron & Co.



WALTER A. HUBER, general manager, wire rope division, John A. Roebling's Sons Co.

William E. Clark has been made general manager of the engineering works division of DRAVO CORP., Pittsburgh. At the same time, his election as a member of the corporation's executive committee was announced. Mr. Clark has been a member of the Dravo board since 1946 and a vice president since 1947. He also serves as chairman of the sales committee.

Robert R. Nadal has been made director of a newly-created dealer development office of the FORD MOTOR CO., Dearborn, Mich. Mr. Nadal joined Ford Motor Co. in 1946. A year later he was named manager of the used car and truck sales department, Ford division.

Carl W. Schaffner, former manager for the Spencer-Heater division of AVCO, Williamsport, Pa., has joined SPROUT, WALDRON & CO., INC., Muncy, Pa., as superintendent of its grey and white iron foundries.

John B. Moxness was named industry engineer in charge of sales promotion of control devices for Brown instruments division of MINNEAPOLIS - HONEYWELL REGULATOR CO.

Paul J. Bracken has been appointed manager of the Philadelphia branch sales office of the NATIONAL RADIATOR CO., Johnstown, Pa. Henry F. White was promoted to manager of the Boston branch sales office.

Walter A. Huber received the appointment as general manager of the wire rope division for JOHN A. ROEBLING'S SONS CO., Trenton, N. J. For the past 9 years, Mr. Huber served as manager of preformed wire rope sales for the AMERICAN CHAIN & CABLE CO., INC. He has been secretary of the Wire Rope Institute for the past 10 years.

Harold J. LaCasse has joined PENNSYLVANIA SALT MFG. CO.'S special chemicals department as field sales service representative in the Indiana territory. Mr. LaCasse takes over the territory relinquished by John C. Hampson who recently became sales manager of the department's recently organized Chicago district.

IRON AGE INTRODUCES

Continued from Page 67

R. E. Johnson has been named Los Angeles manager for the GENERAL ELECTRIC CO. industrial division succeeding E. M. Ellis, whose appointment as Los Angeles manager of the company's apparatus departments was announced in The Iron Age last week.

Carl J. Spain, Jr., has been appointed consulting and application engineer for WESTINGHOUSE ELECTRIC CORP. at San Francisco, after having served in a similar capacity at the Los Angeles office for the past 2 years. Mr. Spain has been with Westinghouse since 1940.

J. Allison, formerly of A. C. GELD-NER & CO., has been appointed sales representative for the states of Oregon and Washington by TITAN METAL MFG. CO., Bellefonte, Pa.

W. F. Strong was recently transferred to GENERAL ELECTRIC'S Dallas office as an application engineer for the Southwestern district. Until his recent transfer, he worked as an industrial application engineer on industrial power distribution.

William C. Etheredge was named general staff manager, general sales department, of the UNITED STATES STEEL SUPPLY CO. He succeeds Eugene. G. Sheasby whose appointment as assistant district manager, Pittsburgh, was announced in these columns last week.



WILLIAM C. ETHEREDGE, general staff manager, general sales department, United States Steel Supply Co.



EDWARD J. DUFFY, general superintendent, Kaiser Steel Corp., Fontana, Calif.

F. F. Tiffany, former district manager of the REYNOLDS METALS CO., Dayton office, has taken over the duties of division manager in the Pittsburgh area, with headquarters in the company's Pittsburgh field office. T. D. Lewis is now division manager located in the Atlanta office, having served as sales representative in the San Francisco area.

H. E. Maser has been appointed representative in the Pittsburgh area for the KERRIGAN IRON WORKS, INC., Nashville, Tenn.

J. C. Poole was promoted from assistant purchasing agent to director of purchases for the HYDRAULIC PRESS MFG. CO., Mount Gilead, Ohio. He has been associated with H-P-M for a number of years, and was appointed assistant secretary in 1948.



J. C. POOLE, director of purchases, Hydraulic Press Mfg. Co.



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GEORGE B. McMEANS, works manager, Kaiser Steel Corp., Fontana, Calif.

George B. McMeans was appointed works manager of the KAISER STEEL CORP. plant at Fontana, Calif. He succeeds F. M. Rich, former vice president of Kaiser Steel Corp., who resigned to become general superintendent of the Indiana Harbor works of INLAND STEEL CO. Edward J. Duffy was made general superintendent, succeeding Mr. McMeans.

L. W. Ellis has been named sales representative in Oklahoma and the western part of Arkansas for the residential, commercial and institutional boilers, radiators and heating accessories produced by the NATIONAL RADIATOR CO., Johnstown, Pa.

Herbert O. Tittell, former production superintendent of the company's Trenton, Mich., plant, has been named manager of the Anniston, Ala., plant of MONSANTO CHEMICAL CO. He succeeds J. F. Reeves, who resigned.

Dr. James T. Eaton has been named director of research of E. F. HOUGH-TON & CO., Philadelphia. Dr. Eaton, who was formerly manager of research, is in full charge of research & control. He was recently elected a member of the company's Board of Directors.

Steve Girard, who became associated with Henry J. Kaiser interests on the Pacific coast in 1938, has been named general sales manager of KAISER-FRAZER CORP. He has been vice president of K-F Export Corp. since 1946 and organized K-F's Rotterdam, Holland, plant.

L. W. Ingram was elected chairman of the board of directors and H. McE. Patton, executive vice president, of the INGRAM-RICHARDSON MFG. CO., Beaver Falls, Pa. E. E. Reagle was elected president of the INGRICH METAL PRODUCTS CO., East Palestine, Ohio, succeeding J. F. Ingram who becomes chairman of the board of directors.

John Hallett, general manager, and Robert Graney, assistant to the president in charge of industrial relations, have been appointed vice presidents of the KAISER-FRAZER CORP. Mr. Hallett, who became general manager at Willow Run last May, has been associated with Kaiser enterprises since 1938. Mr. Graney joined K-F in June, 1949, after serving as a secret service agent assigned to the White House during the Roosevelt administration.

Joseph C. Clennan was appointed sales promotion manager for the midwest regional sales offices of the Lincoln-Mercury Division, FORD MOTOR CO. Norman Mitchell has been named assistant sales manager, Chicago district. Mr. Clennen first became associated with the Ford Co. in 1917, while Mr. Mitchell has been with the organization since 1932.

Lew Sumpter was made special representative of the HUDSON MOTOR CAR CO. He is a veteran of 20 years in the automobile business and held a top executive sales position with Chevrolet for over 17 years.

C. T. Burg was elected president and E. C. Webb, vice president, of the IRON FIREMAN CORP., a wholly owned subsidiary of IRON FIREMAN MFG. CO., Portland, Ore. Both men will continue to maintain offices at Cleveland.

Donald M. Hesling, for the past 4 years master mechanic of the SEALED POWER CORP., Muskegon, Mich., has been named director of the newly established division of the company, the research and development engineering division. Mr. Hesling began his career with the organization in 1937 as chief draftsman.

George H. Davis has joined the iron and non-ferrous casting section of the development and research division of the INTERNATIONAL NICKEL CO., INC., New York. Robert E. Savage and Ralph W. White were added to the magnesium-containing cast iron section of the same division. They will all make their headquarters in New York.

Iron Age, Salutes

NORMAN RENDLEMAN

ALMOST from the day he got a job as an apprentice roll designer nearly 50 years ago, Norman Rendleman has been looking at raised eyebrows. He hopes the day never comes when he quits seeing them, because that would be a sure sign he was slipping.

Eyebrows lifted 30 or more years ago when Mr. Rendleman proposed his design for the 14-in. continuous bar mill at the Aliquippa, Pa., plant of Jones & Laughlin Steel Corp. He heard the word "impossible" many times.

But one man believed in the proposed mill. He was W. L. Jones, first president of J&L after its incorporation, and Mr. Rendleman's boss at the time. Mr. Jones authorized its construction at a cost of \$5 million and the mill rolled its first steel Jan. 1, 1925.

Today, the 14-in. mill at Aliquippa is still unique. Many of its features have gone into America's prolific continuous drive mills.

But Mr. Rendelman's thrill of seeing the mill built was multiplied when the U. S. Navy rated it the No. 1 strategic mill of the industry during World War II, and scheduled its operation. Tremendous tonnages of high military priority sections were rolled on it.

The 14-in. mill and its designer teamed up for another military job some engineers thought impossible. After Pearl Harbor, the rubber shortage forced the Army to switch from rubber to steel treads for tanks. Mr. Rendleman broke a big bottleneck by setting up the mill to roll tank shoe plates in two sections. Welded together, they formed one plate containing two vital pin



holes with a permissible out-ofround average tolerance of not more than .0015". By the time the synthetic rubber program got rolling, approximately 20,000 tons of the shoe plates were rolled.

September will mark Mr. Rendleman's fiftieth year in the industry. He started out Sept. 14, 1900, with Inland Steel Co. at \$1.25 for a 10 hr day. Four years later he was with J&L as superintendent of the Roll Turning Dept. Twentyodd years after that he became operations and development consultant to J&L and retired in November, 1948.

Retirement was short. Two months later he was with United Engineering & Foundry Co., Pittsburgh, as special consultant on bar and shape mill development.

Norman Rendleman's got a lot of plans up his sleeve. And when he springs them more eyebrows will lift.

Fintroduces

Continued from Page 69

Stephen A. Ceruti was appointed assistant western division sales manager for APEX ELECTRICAL MFG. CO. Mr. Ceruti will aid L. D. Stull, western division manager. He joined the Apex organization in 1937 in the accounting department, was named office manager of the San Francisco branch office in 1947.

J. W. Martin takes over as manager of field sales for the WESTING-HOUSE ELECTRIC CORP. small motor division at Lima, Ohio. He has been with the organization since 1925.

H. L. Purdy has been elected a vice president, with offices in San Francisco, of the PURDY CO., Chicago. At the same time, the appointment of Frank Pickett as scrap buyer in the San Francisco area was announced.

Herman Dobsha is now manager of the Smith works, WHEELING STEEL CORP., succeeding John Tatman. W. G. Hobstetter, chief engineer of the Smith works, has been transferred to the Yorkville works in the same position.

Frank Farrel, III, was elected executive vice president of FARREL-BIRMINGHAM CO., INC., Ansonia, Conn. Other elections included Joseph LeMay, secretary and assistant treasurer and Mrs. Wiliford Whiteside, assistant secretary.

Edna M. Kubik was appointed sales manager of PROTECTOR PROD-UCTS, INC., Cleveland. Miss Kubik was formerly assistant sales manager of WEDGE PROTECTORS, INC., Cleveland.

Russell G. Runyan became general purchasing agent for OLIVER UNITED FILTERS, with headquarters at the company's Hazleton, Pa., plant. He succeeds G. I. William who is retiring. Leonard K. Armstrong of the Oakland, Calif., purchasing department has been appointed assistant purchasing agent at Oakland.

Arthur Templeton joined the sales engineering staff of TEMPLETON, KENLY & CO., Chicago. He has served for the past 4 years in the production department.



H. F. HAGENAUER, purchasing agent, Ahlberg Bearing Co.

H. F. Hagenauer has been appointed to the post of purchasing agent for the AHLBERG BEARING CO., Chicago. He succeeds P. F. McGuinn, for many years vice president and purchasing agent, who died last November. Mr. Hagenauer has been with the company for 31 years.

Clark E. Thorp has been named chairman of chemistry and chemical engineering research at Armour Research Foundation of Illinois Institute of Technology.

Lawrence M. Rich became vice president in charge of sales for the WILTON TOOL MFG. CO., Chicago. Mr. Rich will direct sales, advertising and sales promotion activities for the company.



DON SMITH, production manager, polishing and finishing division, Midway Tool Co., Inc.

Don Smith was named production manager of the polishing and finishing division of the MIDWAY TOOL CO., INC., Melvin, Ohio. He has been a member of the Midway organization for the past 2 years.

William O. Faxon was named to manage sales for the Harrison Abrasive Division of METALS DISINTE-GRATING CO., INC., Elizabeth, N. J., in New England and the middle Atlantic states.

William F. Schupp was named assistant district sales manager of REPUBLIC STEEL CORP.'s Cincinnati district sales office. Mr. Schupp has been with the company since 1925.

OBITUARIES

William F. Rummell, vice president in charge of sales, the Thomas Steel Co., Warren, Ohio, died Mar. 10.

Frederick D. Ryan, president, Allyne-Ryan Foundry Co., Cleveland, died Mar. 18 while on vacation in Florida.

William E. Dever, 55, a member of the law department of International Harvester Co., died recently.

A. F. Strafer, who was associated with the Strafer Machinery Co., Baltimore, and had been closely identified with the machine tool industry for the last half century, passed away recently.

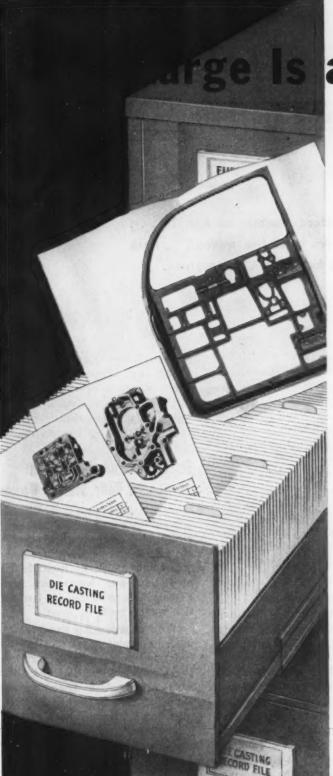
Wyllys G. Hooper died on Mar. 11 in St. Louis. He had served as vice president and director of the Midwest Piping & Supply Co., Inc.

Fred J. Buckley, 82, president and chief engineer of the Kalamazoo Foundry & Machine Co., died on Feb. 16.

Frank A. Luebbe, vice president and general sales manager of Nichols Wire & Aluminum Co., Davenport, Iowa, died on Mar. 9.

Henry M. Miller, chairman of the board, American Monorail Co., Cleveland, and one of the organizers of the company in 1926, died Mar. 16. He was 82.

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This question has been asked frequently since our last achievement of die-casting automobile door-panels. In size this die casting is forty-three inches high; thirty-three inches wide.

So far, it is the largest aluminum die casting produced.

There is no limit within reason

New vistas ahead are as limitless as the designer dares to imagine. Our engineering and research departments are anxious to cooperate to make your imagination a reality. A phone call to one of our plants, located nearest to you, will bring immediate response.



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March 30, 1950

On the ASSEMBLY LINE

AUTOMOTIVE NEWS AND OPINIONS

Nash will introduce low-priced Rambler on Apr. 14 . . . Fisher ends wooden body era of station wagon . . . Nash agreement may prove basis for ending Chrysler strike.



Water & Potter

Detroit—What the public wants in the Nash NXI experimental automobile was revealed by George W. Mason, president and chairman of the Nash-Kelvinator Corp., last week. He gave out the results of the Nash poll on motoring opinion at a press preview of the new Nash Rambler. The low-priced Rambler will make its debut on Apr. 14 when The Iron Age will carry a complete description of the model. All that can be said now is that the car has many innovations in styling, engineering, and customer appeal.

To get back to the public's suggestions about small NXI automobiles, Mr. Mason said the questionnaires indicated that instead of divided front seat in the prototype, motorists want a single unit seat, providing seating room for three

passengers instead of two. The public wants a wider tread. It wants the wheelbase five or six inches longer than the NXI experimental cars. A typical car buyer asks for a two-passenger seat in the rear. He strongly prefers the 36 hp motor to an 18 hp motor.

A large number of persons answering the Nash questionnaire indicated they would like a wheelbase about half way between the 80 in. of the NXI and the 120 in. of the large conventional cars. Many motorists ask for an engine between 50 and 75 hp, Mason said.

Features Motorists Want

Here are some of the features motorists seem to feel are highly desirable. The figures in parentheses give the percentage in favor of this feature: Deep and wide windshield with a low cowl and hood (95.1 pct); lack of ornamentation (86.9 pct); single-unit fender and hood assembly which swings up for servicing (90.1 pct); combined grille and bumper (90.1 pct). Nearly three quarters of the motorists polled favored the inside luggage storage feature in preference to an exterior trunk compartment lid.

As someone remarked at the preview last week, it is probably only coincidence that nearly all of the features requested by the public are incorporated in the new Rambler which drew a big round of approval from the Detroit press

section. "The crystal ball gazers in Nash's engineering and styling departments must have been right on the beam a long time before the sales department made the survey," was the way one wag put it.

Fisher Div. Ends Production Of Wooden Body Station Wagons

Several years ago H. J. Klinger, general manager of Pontiac Div. indicated that wooden bodies would soon disappear entirely from the automobile industry. Recently this prediction was borne out when Fisher Body produced its last station wagon made of wood.

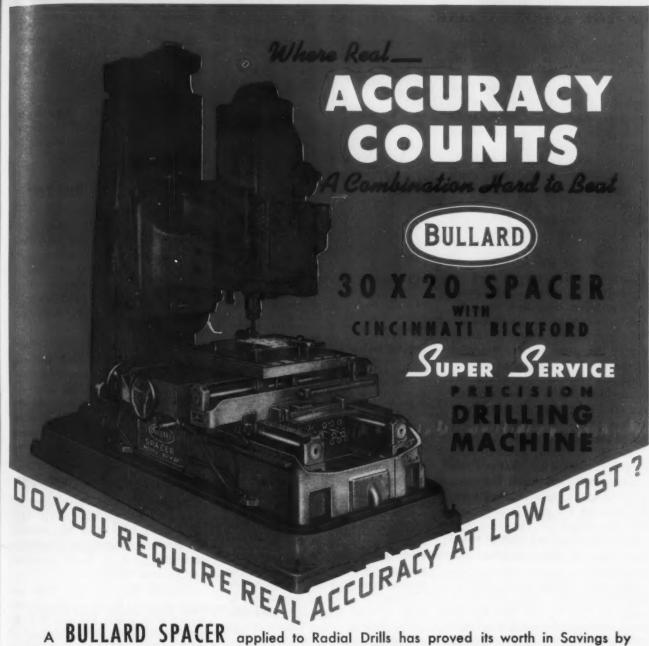
Wood construction has been replaced completely by the Unisteel body and turret top construction for Chevrolet, Pontiac and Oldsmobile. Fisher Div. is also producing sedan delivery bodies for Chevrolet and Pontiac at the Euclid, O., plant Fisher took over from Ferguson Tractor Co. after the war.

Get Wood Effect

Fisher has been building a limited number of special commercial bodies of the delivery type for a number of years. Current production rate on the new all-steel bodies is 200 per day. The Euclid plant is presently employing about 1200 workers.

Fisher is using a technique which is gaining acceptance in the

Ma



A BULLARD SPACER applied to Radial Drills has proved its worth in Savings by eliminating many costly jigs previously required on many drilling operations.

Almost unbelievable operational Savings have also been made.

However, Accuracy is only as good as the accuracy of the Drill to which the Spacer is applied. To assure the Accuracy of which the spacer is capable, Cincinnati Bickford offer their Super Service Precision Drilling Machine.

With a Precision Spindle in the drill, this combination is Hard to beat on reproduced Accuracy of hole spacing, drilling, reaming and tapping.

Installations of this type are proving Profitable investments in numerous plants. Ask Bullard or Cincinnati Bickford about this "Natural" combination.

March 30, 1950

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automobile industry of achieving a hardwood grain effect with decals that transfer the grain pattern directly to the metal. The transfer simulates wood to a remarkable degree. A similar technique may be used on instrument panels.

Fisher engineers argue that the new all-steel bodies are much stronger than the former wood models. They are easier to maintain, stay tight and give much superior owner satisfaction, it is reported.

Since World War II ended, the automobile industry has ruined the reputation of many of the country's prophets who have been seeing an early end to the lush market for motor cars. Another example of the unpredictable behavior of the industry was given last week when Chevrolet announced that its deluxe line of cars is now accounting for 78 pct of total sales whereas last year's figure was only 74 pct of the total.

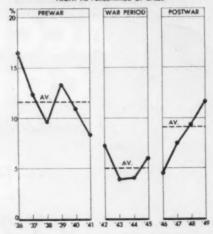
As W. E. Fish, general sales manager, pointed out, this is a new experience for Chevrolet. The usual expectation is, he said, that when the demand for cars is softening, the percentage of Chevrolet specials (which sell at a slightly lower price than the deluxe models) tends to increase.

Mr. Fish did not say to what extent the Chevrolet sales picture has been changed by the new Powerglide automatic transmission. Also its much-wanted hardtop sedan, the Bel-Air has stiffened the market for deluxe models according to reports from the trade.

Four Unions Approve Pension Plan of Nash-Kelvinator Corp.

The Nash-Kelvinator pension and health program which is being hailed by the union "as the most advanced yet" certainly must be just that. The remarkable thing about the Nash agreement is that it has met simultaneously the requirements of four unions: The UAW-CIO, the International Association of Machinists, the AFL Teamsters and the Mechanic's Educational Society directed by Mathew Smith. This is agreement

GM'S PROFIT POSITION IN THREE PERIODS
PROFIT AS PERCENTAGE OF SALES



PROFITS: GM's profit on sales in the high volume year 1949 was 11.5¢ per dollar but the average for the four years 1946 to 1949 was 9.1¢. In the pre-war period 1936 to 1941 the highest profit reached was 16.6¢ per dollar of sales in 1936 but the average for the period was 11.5¢. The period 1942 to 1945 was abnormal due to concentration on war production and voluntary limitation of profits.

on a scale practically unknwn in Detroit labor history.

According to informed sources, the Nash agreement plus the clarification of the controversy with Ford over the payment of $8^3\!\!/\!\!/\epsilon$ into a pension found has provided a track for the Chrysler negotiators to ride to a quick settlement of their differences. As this is written the Chrysler negotiations have narrowed to four men on each side—always a sign that agreement is near. Some sources believe the strike may be ended before this is published.

Gives \$100 Pension

The new Nash contract provides for \$100 pensions, including social security payments. Nash will contribute 10¢ per hour into the pension and insurance fund of which 7¢ minimum goes for pensions. The insurance contribution by the company totals 2.6¢ and 0.4¢ goes for administration. The unions will contribute 1.7¢ toward the cost of the insurance program.

Under the terms of the new agreement, there is no compulsory retirement age and 1700 hours of work annually are required for maximum benefits. Eligibility requirements are 25 years of service and 65 years of age.

According to union sources, Nash will contribute 7¢ per hr regardless of future changes in social security. A joint study of vesting possibilities under the plan is set for 1952. Administration of the pension fund is joint but financing is under complete control of the company.

Studebaker Reports Best Year

As a result of a 30 pct gain in production during the year 1949, Studebaker enjoyed the best year in its history. The company sold 304,994 passenger cars and trucks, exceeding the 1948 total by nearly a third. The rate of production increase for the entire industry during 1949 was 18 pct.

Dollar sales of \$473,119,000 were at an all-time high and the company reported a record net income of \$27,563,876, an increase of 44.2 pct over earnings during the previous year. Net income was \$11.70 per share compared with \$8.11 in 1948.

Hudson Car Co. '49 Income Down

Hudson Motor Car Co. for the year 1949 has reported net income of \$10,111,219, after all charges for interest, depreciation and taxes, according to A. E. Barit, president and general manager.

Hudson earnings for 1949 are equivalent to \$5.30 per share compored with a net income of \$7.28 per share in 1948. According to Mr. Barit, most of the reduction in sales volume and earnings was accounted for by reduced replacement parts and accessories business and failure to obtain steel in adequate quantities at mill prices.

Goodyear Income Drops

Consolidated net income of the Goodyear Tire & Rubber Co. for 1949 totaled \$20,230,520, equivalent to \$8.40 per share of common stock outstanding. This compares with \$24,095,518, equivalent to \$10.25 per share for the year 1948.

Consolidated net sales for the year amounted to \$633,505,978 which compares with \$704,875,941 for the year 1948.





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These added values make the P&H Zip-Lift

America's most popular little wire rope electric hoist

SAFER - 110 volt push-button control. No open wiring. Plugging type limit switch; double brakes.

LIFETIME CONSTRUCTION - Precision built gears running in oil — grease-sealed antifriction bearings — fully enclosed, moisture-proof, dust-proof, acidproof. Motor designed for hoist service.

ALERT SERVICE — Out-of-stock delivery from qualified dealers everywhere — also backed by 19 branch offices and conveniently located warehouses.

And Now . . . Still More New Features -**All Standard Equipment**

- Lower limit stop meets all safety codes. Extra ground conductor in feeder cable and push button pendant.
- Reinforced push-button pendant.
- Grooved drum for longer cable life.
 - Available in capacities up to 2000 lbs.

That's the big thing about this little hoist!

Skilled workers should never be allowed to heave heavy loads by hand. Let them put their time and effort where they belong-in production.

In thousands of plants "thru-the-air" handling with the Zip-Lift is saving time-earning money... beside machine tools, along assembly lines, around loading docks, receiving rooms, warehouses-wherever the handling of loads up to 2,000 pounds can be turned into a push button job.

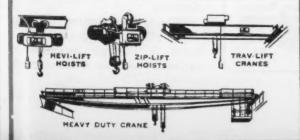
What are your chances for making money with the Zip-Lift? Any P&H Representative will show you where-and how-and how much profit it will earn for you.

Meanwhile, bulletin H20-4 may help you. It's filled with money-saving ideas. Write for it. Use the coupon below.



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WEST COAST PRO



Small chance of Japanese steel being imported to compete with U. S. producers . . . Will take large share of Oriental market.

Digest of Far West Industrial Activity



Tokyo-Little competition between the steel industry of the West Coast and that of Japan is seen by chiefs of the economic section of the United States military mission in the Far East. Import and export to the U.S. is being discouraged by Army officials.

The Japanese steel industry, which is making a rapid comeback under the watchful supervision of General Douglas McArthur's staff, is concentrating on the oriental market.

Shipbuilding Flourishes

Most of the finished steel products being produced are designed for conditions in the Far East and are in skeleton form which differs from those produced in the United States. Locomotives, which form one large segment of the Japanese industry, are smaller and cheaper than those of the U.S. They are not as good but do meet requirements here.

While the shipbuilding industry is in the doldrums on the West Coast, it is prospering in Japan. Low costs here are cutting the

prices of other foreign countries and are getting contracts from both Europe and the Orient. Recently completed was a 14,000 ton cargo passenger ship for the French. In the construction stage

As a journalist and official U. S. delegate to the Interna-tional Congress of the Junior Chamber of Commerce held recently in Manila, Herbert G. Klein, IRON AGE correspondent for southern California, spent several weeks in the Orient studying business conditions. Among those he interviewed were General Douglas MacAr-thur and Philippine President Elpidio Quirino. This is a brief report of some of his findings.

Ed.

countries. Import restrictions, set to improve the dollar balance and put

are other vessels for the Phillippine Republic and Scandinavian

Japan on its feet economically, preclude most importations. Scrap which was exported for a short while is used now almost entirely by the Nipponese industry.

With Japan able to supply steel needs of the Far East, there appears little opportunity for western industry to export competitive products in this area.

Actually the greatest competitor of the Japanese in the fight for the Far East market is Germany, also under U.S. military rule. Belgium and Great Britain are rated second by T. O. Kennedy, industrial chief of the Supreme Commander of Allied Forces (SCAF).

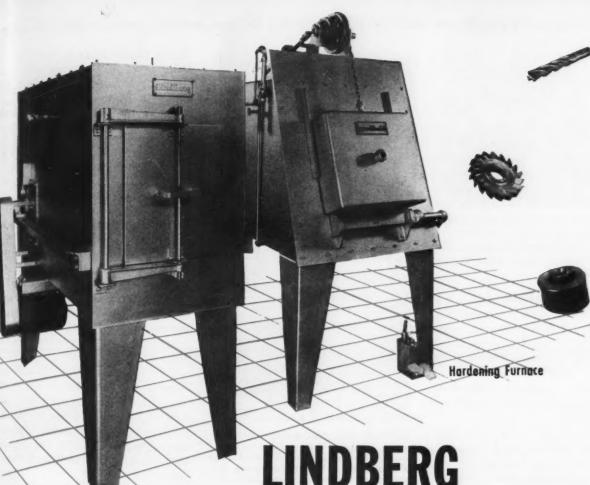
Japanese steel mills, now owned by new companies to prevent repetition of the power placed before the war in the hands of five holding companies, are producing a little more than 3 million tons a year. Wartime peak was 6 million tons a year. The 1949 figure equals steel production for the 1932-1936 average in Japan.

Must Sell Finished Products

Australia is considered the greatest 1950 market for finished steel products from Japan with the Philippines rated second. Structurals are sold in large quantities to Siam, according to Mr. Kennedy.

"The greatest future for taking Japan off the U.S. donations from taxes is through manufactured products such as finished steel,"

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For the precise hardening and tempering of expensive tools and dies—specify Lindberg Hardening and Tempering Furnances.

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commented Gen. W. F. Marquat, chief of the economic and scientific section for SCAF.

"We are not interested in selling ingots. We need to sell finished products to provide jobs. This is the Great Britain of the Orient. Natural resources must be brought in and manufactured for resale. This is the workshop of Asia." Plates, bars, rods and structural shapes are the principal products of Japanese mills.

"Japan's greatest resources are electric power and labor," Gen. Marquat opined.

Newest Mill at Kobe

The newest steel mill opened in Japan is at Kobe. It was being completed by the Nipponese at the end of the war and the finishing touches have been put under American supervision. Technical supervision from this country is needed badly.

Even with the new mill, General MacArthur's staff does not intend to allow the industry to reach anywhere near wartime peaks. To solve economic problems, however, SCAF regards the iron and steel industry as Japan's number one industry.

Reds Changed Market Picture

Occupation of China by the Reds has changed the entire market picture for the Japanese as China once was its best customer. Ore which formerly was purchased from China now is obtained from the Philippines. Japanese coal remains of low grade and most blast furnaces now are using 70 pct Japanese coal and 30 pct imported from the United States. They are trying to make entirely native coke, however, and are experimenting with the coalite processes. Although they use all Japanese coal for the process, the costs thus far have proved as great as buying raw material from the United States, according to Mr. Kennedy. Chinese coal was used in coking for blast furnaces before the Reds took over.

Pennsylvania coal costs on the average \$23 a ton delivered here and iron ore from the Philippines runs \$10 a ton, Mr. Kennedy said.



REINFORCING: Pre-assembly method of setting Bethlehem Pacific reinforcing steel, used by the firm of Rutherford & Skoubye in construction of Los Angeles sewage disposal plant, has the time-saving advantage of being able to place the work quickly in correctly spaced locations on a horizontal bed or jig. In photo crane is lifting fabricated and assembled wall section into place.

Mr. Kennedy said that 35 pct of the Japanese steel now is being made in electric furnaces.

In pig iron production, approximately 160,000 metric tons was being turned out monthly by the end of last year.

Steel Demand Continues; Long Range Prospects Good

Los Angeles—Although sales have been slow in some lines during the first three months of 1950, steel salesmen here are seeing some signs of increased demand and many predict that this year will be as good as last.

Partly because of the recent coal strike which caused some slackening on shipments here from the East and partly because of a brisk demand, sheets of most sizes are still in the seller's markets. Demand is high for sheets and some mills are allocating them.

The market remains brisk in the sales of strip, pipe and stainless steel. The latter is in good demand in southern California because of the automotive assembly and aircraft plants located in this area.

Mills Lowered Production

Mill sales executives believe that the overall market in southern California has held up a little better than that on other parts of the West Coast although it has been spotty here too. Potentially, this area remains the West Coast's greatest steel market because of the increasing heavy industry and the large number of automotive assembly plants which are increasing Coast purchases gradually.

Structurals and bars have become a drug on the market and mills here have dropped production in these lines to as low as 50 pct in some cases. Sales to companies building farm implement equipment and oil well tools have been poor.

An indication of the latter was a report issued this week showing oil well drilling in California lagging behind that of last year. There have been only 328 new wells drilled this year compared with 563 a year ago at this time, according to the state division of oil and gas. Oil well tools, however, do not represent a major share in the steel market here.

Long range demand, which will continue for at least 10 years, comes from a California highway development program. An entire system of freeways is being built in the Los Angeles area with numerous bridges requiring H piling and other types of steel and castings.

Sheet Market May Be Saturated

Although so many appliances have been sold in southern California that steelmen have been inclined to believe that the sheet market might be near the saturation point, at least so far as stove, refrigerator and washing machine factories are concerned, sales have continued to be good in this field.

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1875—For centuries, hard labor and a paintbrush were man's main means of adding beauty and color. But, with the industrial revolution at hand, new devices were sorely needed to break this bottleneck.



2 1900—The artist's airbrush was born. On its heels came the paint spray gun. Both products, strangely enough, stemmed from the atomizer used by doctors to prevent colds, Painting swung into high gear.



1915—Portable paint-spraying equipment was introduced in this, the year Howell "Red Band" Electric Motors arrived. Soon these rugged motors made important contributions to this and other industries.

PAINT... protects, preserves, decorates and sells!

(AND HOWELL MOTORS HELP SPEED MODERN PAINTING PROCESSES - CUT COSTS)



Free enterprise encourages mass production, supplies more jobs-provides more goods for more people at less cost.



Howell totally-enclosed, explosion-proof motors for use where inflammable liquids or gases are handled or stored.

HOWELL MOTORS

HOWELL ELECTRIC MOTORS CO., HOWELL, MICH.

Precision-built Industrial Motors Since 1915





THE FEDERAL VIEW

THIS WEEK IN WASHINGTON

Truman Point Four Program given cold Congressional shoulder . . . May be stalled to next session . . . Plan calls for small business subsidized research unit.



Eugene J. Harly

Washington-Still bogged down in what can be termed nothing more than "Congressional indifference" is President Truman's "Point Four" program of economic and technical assistance to the underdeveloped areas of the world. The program was proposed by Mr. Truman in his State of the Union message in 1949. Progress toward enacting legislation to carry it out has been glacial-like.

There is some doubt that Congress will o.k. the proposal before adjourning the present session, despite the fact that "Point Four" is on the Administration must list. This would mean that legislation would have to be re-introduced and started all over at the convening of the 82nd Congress next January.

Latin-America First

Current Administration legislation would get the program started by providing \$45 million to pay experts and train foreign officials. Another must bill providing for Export-Import Bank guarantees egainst expropriation or blocking of funds of private investors is before the Rules Committee.

If the program ever gets underway it still appears certain that the Latin-American countries will be among the first to benefit. THE IRON AGE, May 12, 1949, p. 112). For example, the recent Regional Conference of United States Ambassadors in South America covered not only the "Point Four" program but also technical assistance programs in South America that have been operative during the past several

Despite Administration ballyhooing of the large part private funds will play in the program, it is becoming obvious that those concerned with the program really don't believe this will happen. Foreign governments will seek aid from the Export-Import Bank, the International Bank and other governmental sources. The Ambassador's Conference agreed that "maximum development will require that local capital funds be supplemented by a substantial volume of United States private investment and the resources of lending agencies in Washington."

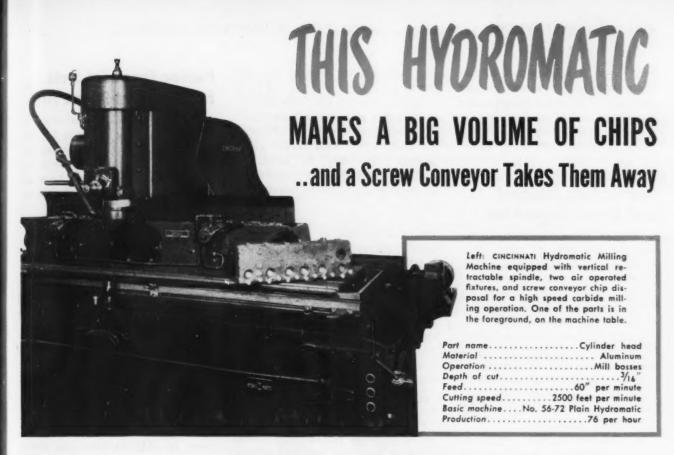
The Export-Import Bank, in a recent report to Congress, admitted that government funds will be necessary "along with private investments since certain types of

essential developments and certain areas are not likely to attract private capital." Such areas, noted the report, are those where basic facilities as transportation are needed and where conditions are not sufficiently stable.

More Than Few Loans

The report further pointed out that "more than a few years and more than a few loans and a few private investments" may be needed to make a significant impression on some of the underdeveloped countries. The report did not ask for an increase in the Bank's lending authority to help get the program going, although it would appear that such action will be necessary if any real effort is to be made.

From still another angle, the Administration is also plugging for this program. Treasury Secretary John Snyder says that Truman-proposed changes in the tax laws "should be a major factor" in increasing foreign investment. These changes, now being considered by the House Ways and Means Committee, would require the taxation of income of foreign subsidiaries of American firms



A big volume of chips implies high speed and feed rates, and stamina to withstand continuous operation. The CINCINNATI Hydromatic Miller illustrated here has all these qualifications, plus an automatic chip conveyor which solves the problem of getting rid of the chips without stopping production. ¶As you might suspect, Cincinnati Application Engineers had a hand in developing this equipment. Starting with a standard No. 56-72 Hydromatic bedtable unit, they added a special headstock and vertical head having retractable spindle, two air operated fixtures, and a power screw conveyor chip removal unit.

Hydromatic's two-way feed lays the ground work for the twin fixture technique — loading and unloading one while the part in the other is being milled. The retractable spindle feature saves the surface finish. The chip conveyor relieves the operator of an unpleasant job.

Equipment of this type can reduce costs in many shops . . . perhaps yours. Our Application Engineers will help you decide.



CINCINNATI Plain Hydromatic Milling Machine. Write for new picture book type of catalog M-1670.

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only after it is remitted to the United States. It would exempt earnings of technical experts during their entire service abroad, rather than after one year's residence as is the case under existing law.

Congress Plans Subsidized Small Business Research Unit

Another piece of election-year bait for the votes of small businessmen is being prepared in the Senate.

The new bid for favor is in the form of government-subsidized research for small business firms.

Senate Majority Leader Lucas, D., Ill., who is backing the bill in the Senate, says such a program is necessary because most small businesses cannot afford the type of research programs that many large firms maintain.

In addition, smaller companies would benefit by receiving the latest information on such matters as in ventory control, purchasing on specifications, acceptance testing, and quality control of production.

Lucas says it's his "firm belief" that such a program is "essential" if small business is to compete on even terms with larger companies. "In fact," he adds, "I believe such a program is essential if small business is to survive in this new era."

As to financing, Lucas would give the Bureau of Standards a greatly-increased annual appropriation to carry out the proposed program.

This is the fourth attempt in the Senate within recent weeks to curry favor of small business. Other current "small business" programs now in the works include the setting up of a special Senate committee to study the "problems of small business," several bills authorizing the Reconstruction Finance Corp. to guarantee up to 90 pct of bank loans to small business, and the establishment of a "small business coordinator" under White House supervision.

THE BULL OF THE WOODS

By J. R. Williams



Maritime Commission Seeks Funds to Protect Reserve Fleet

The Maritime Commission wants Congress to give it about \$2 million to install cathodic protection on one-half the bottoms now in the reserve fleet. The funds have already been approved by the House Appropriations Committee.

Originally, it had been planned to install surplus Navy drydocks to preserve bottoms of vessels now in permanent reserve. Usual sandblasting and painting would have been the method employed. However, tests of the cathodic method (anti-fouling paint with long-time efficacy) showed that full protection could be obtained at less than one-half the cost of doing the work in commercial repair yards.

The \$2 million will cover only half the reserve fleet, with the remaining half to be protected next year. In addition, Maritime would like to spend \$7.5 million for regular reserve fleet expenses during the fiscal year 1951.

Up until Dec. 31, 1949, 4,000 vessels had entered Maritime Commission reserve fleet anchorages. Of these almost 2,000 were withdrawn for operation, charter or sale. About 1,500 of the reserve fleet ships have not been drydocked for from 3 to 5 years.

Fleet Stability Seen

Chartering and sales are now drawing to a close and the reserve fleet will soon be stabilized. By June 30, 1951, 95 pct of the basic preservation work will be completed. About 713 vessels will be laid up during the coming year.

After the basic work is completed, the basic costs will go down to less than \$5 million annually, exclusive of bottom preservation. Over a six-year cycle, it is estimated that the cost of bottom preservation will approximate \$1.35 million a year, or approximately \$600 per vessel per year. It costs about \$8,000 to initially lay up a ship. Future costs are about \$2,000 annually, plus \$600 for cathodic treatment of bottoms.



THE COST CUTTER

"Industrial Cost Cutting," the theme of the annual convention of the American Society of Tool Engineers, is especially appropriate at this time. The higher costs of doing business force industry to examine all its operations to reduce expenses wherever it can. Some of these higher costs seem almost fixed: Taxes, raw materials, wages, pensions, and freight.

Through the tool engineer, however, industry still has a fertile field in which to save on the cost of making things. How a product is made, the materials used, buying practice, design of the tools of production and intra-plant materials handling are all fertile fields for cost study.

THE IRON AGE, in this ASTE convention issue, describes several cost-cutting programs that are really working. They cover heat treating, gear cutting, tool-making, resistance welding, tool control and tool material standardization. In addition, a "Tool Engineers' Notebook" tells how costs were cut on dozens of different jobs in a wide variety of plants.

Tom C. Campbeac

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Cutting Costs -

By Coordinated TOOL CONTROL



By C. W. Dixon

Worthington Pump & Machinery Corp.,
Harrison, N. J.

Coordinated plant-wide control of cutting tools has saved a lot of money for Worthington. The program and its benefits show how the plan may be applied in other plants.

ATHOROUGH and unified plant wide tool control program has enabled Worthington Pump & Machinery Corp., at its Harrison, N. J., works, to make substantial savings in operations using carbide cutting tools. The Coordinated Carbide Control system has kept the cost of cutting tools at a minimum by plant-wide standardization, and fabrication and maintenance of all tools at a central point. This has reduced equipment and personnel requirements, and provided the best equipment and trained specialists. Inventories are controlled and kept to meet only actual needs.

The elements of the program—Methods, standards, design, procurement, fabrication, reconditioning, inventory control, application, and trouble-shooting—have been integrated under the guidance of the tool and equipment engineer, who serves as carbide coordinator. The tool and equipment engineer also has certain supervisory responsibilities.

Worthington's Harrison works employs about 3000 in the manufacture of pumps, condensers,

compressors, air conditioning and refrigeration units. Over 90 pct of the single point tools are carbide, particularly on lathes, boring mills and precision boring machines. Various milling machines, multiple-spindle screw machines, and other machine tools are equipped with carbide tooling.

Periodically, the supervisor of methods and standards sends a report on "New Standards and Changes in Standards" to the assistant works manager. This report, shown in Fig. 1, shows time standards and enables plant executives to tell what tooling progress is being made.

While Worthington's product diversification requires many different tools, standardization, especially in single point carbide tools, is a dominant theme. Wherever possible, the difference in a tool is confined to grinding specifications. One person in the tool and equipment division, concentrates on design of single point carbide tools, furthering standardization by using as few different tool shanks and as few different carbide blanks as possible.

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H	30-475	PISTON FOLLOWER	100	43.3	30.5	P	,	40	w	200	100					
PLANER	4SC-76	MATER CYLINDER	C457/800	56	40	P	•		CUTTERS	MILL	ENOS.	410	VALVE FACE			
		4 9		26	23	A				MILL	FEE	-				
	9546-J	COOLER SHELL	C457/80N	62	25	0	,		10	ARLL	END	AND	TOP FACES			
fit.			0	28	21	P	,			MILL	PEET	ANG	SIDE PAD			
	409-8	SUPPORT	*	24	13	1	,			MILL	15/4	10%	FACE			
	-			20	15	1	0		40	AN/L	074	ER I	FACE	1		
VERTICAL TURNET LATHE	276-19	LIQUID CYLINDER	C437 (MIN	80	54	1	0	*	70065	FACE	AND	TUI	IN FIT'S.			
40	7328-J	INLET VANE	10	122	84	1	0			BOR	E FAC	E 70	WAN COMP.			
**	7335 - J	10 10		122	70	1	D			20	40	-	10 20			
LATHE 20"	67892	SHAFT	SAPAGE	103	54	1	0			TUR!	N COM	AP PI	OR GRIND			
. *	67898			/28	73	1		42					20 20			
	678-M		MENEL H	101	59	1	p			-						
TURRET LATHE (BAR)	483-8	BUSHING	SAE MOS	15	11	1	9	10		COM	IR AA	D.CI	CE TURN			
12	30-16/	TIE ROD	SAE 1/20	17	11	1	0	*	*	CUT	RAD	N 7h	IND LINDER	-	-	-
			-	-		-	-	-		-				+	-	-

Fig. 1—This report aids in evaluating overall tooling programs. It lists only standards changed as a result of conversion to carbides. An average saving of 42½ pct in pure time alone was made.

A range of 17 standard catalog-listed, supplier-stocked carbide blanks are adequate for tipping about 90 pct of all single point tools required. These blanks are shown in Fig. 2. Other standard blanks for special tools are stocked in smaller quantities. A tool catalog system has been developed, and to save time in handling prints and facilitate finding a tool of specific dimension, a catalog page shows a common tool style in outline and alongside it lists all dimensional variations of that tool, as shown in Fig. 3. The basic tool style is numbered and each variation bears this common number as well as a suffix to indicate the particular modification.

Among the benefits of cataloging tools are: (1) Saves time in designing tools by revealing the availability of any tool of a given description; (2) facilitates assigning a number to a new tool design so that it can be quickly located; (3) encourages the use of standard tools by showing what is available and minor variations of the basic tools; (4) permits grouping of orders for tool fabrication so that all tools with a common shank can be cast or machined at the same time; (5) facilitates salvage of tools by showing the relationship of designs, so that in the event a worn tool loses its identity as one number, it becomes applicable, by modification, for continued service as another number; (6) shows, over a period of time in conjunction with inventory records, what semi-standards can be disposed of as having little activity and what tools offer the greatest versatility and performance as true standards, and (7) prevents overloading tool cribs with inactive tools. Thus, when a request is received for a new tool of specific design, the designer is often able to prove that a tool is already available that can do the job equally well.

An experimental tool program has resulted in selection of the carbide grade that provides the greatest service on each class of work material, and the selection of a group of standard tool styles adaptable to many different operations. Also, the program has resulted in the evolution of established optimum feeds and speeds for various types of machining work on each metal used in products manufactured. These speeds for turning various materials in an engine lathe are shown in Table I.

Each metalworking department has its budget for normal tooling costs, all tools made or procured being charged against it. In the case of new product design or a change in design, new tooling may be required. A major product development program is usually followed by a major tooling program, with an above-budget appropration. While such a program is being planned, meetings of the tool and equipment engineer

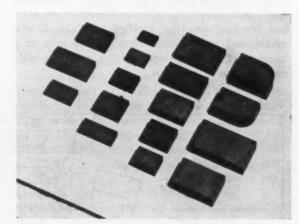


Fig. 2—These 17 standard carbide blanks are used in tipping 90 pct of all single point tools. This includes 1200 new tools and about 500 retipped tools a month.

with the methods and standards supervisor and the supervisor of stores assure harmonious progress of the program and the full contribution each individual can make.

During planning, foremen are called in for

Continued

discussion of specific requirements in connection with the overall program. When tooling requirements have been tentatively agreed upon and costs estimated, a special appropriation is requested by the tool and equipment engineer of the plant manager, the assistant plant manager and the machine shop superintendent.

With the exception of the draftsman who specalizes on single point carbide tools, designers in the tool and equipment division, are assigned on a project basis. Responsibility for design of all cutting tools, holding fixtures, and accessories required for a job is given to one man.

When the new tooling program is initiated for a product, the sequence of operations and machine tools to be used are designated by the methods and standards department. The tool designers assigned to the project then proceed to draw up the various tools and accessories needed.

When tool designs are approved, material is requisitioned for the fabrication of special tools. These are generally manufactured in the plant's tool room, which is under the supervision of the tool and equipment engineer.

Copies of all tool drawings go to Methods and Standards. Tool drawings, part prints, and routing cards are used by the methods man or standard setter in analyzing the job, determining by what methods it can be done best, and breaking down the procedure into basic elements. To these elements are applied time standards, quickly selected from standard data books developed for this purpose. Three methods men have had special training in carbide application.

Standard data provided includes established feeds and speeds for specific materials on various types of machine, typified by Table I, and established normal time required for each of a number of basic motions and for certain widely used groups of motions.

TABLE I

STANDARD DATA SHEET

Worthington Sets up Machining Data for Various Materials on Specific Machine Tools in This Form. This is for a Specific Engine Lathe.

Material	100 Pct fpm	Minimum Diameter
M 4205 8 7 9 9 12 12 13 14 15 15a 16 17	427 403 341 403 341 341 341 332 311 332 332 332 332 311	2.93 2.77 2.35 2.77 2.35 2.28 2.13 2.28 2.28 2.28 2.13
21	242 242 231 252	1.66 1.58 1.68
31	272 272 272 272 272 286	1.86 1.86 1.86 1.86 1.76
41	256 256 258 258 245	1.76 1.76 1.76 1.76 1.76
50 51 52 53 58	245 245 232 225 211	1.68 1.68 1.59 1.54 1.45
61 62 63 64 65 66 66 66 67 68 69 69	205 198 198 198 250 192 174 174 152 192	1.68 1.38 1.36 2.00 1.32 1.20 1.20 1.04
70	105	0.73
90	211	1.45
VI 4480	211	2.13
M 3270,	105	0.73

Studies on thousands of jobs have established fixed time standards for certain fundamental motions, combinations of which are present in all operations. On certain classes of machines, the

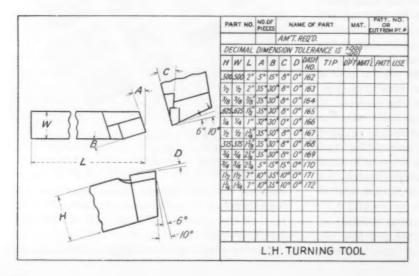


Fig. 3—The key to cost reduction in tool fabrication and reconditioning is to catalogue tools so that similar ones can be recognized at a glance. This example shows that some 172 variations have been developed from one basic shape.

Triple C Program

Last spring, Carboloy Co., Inc., Detroit, announced a Coordinated Carbide Control program designed to assist metalworking plants to reduce manufacturing costs through plant-wide coordination of activities relating to cutting tools. The program covered tool design, application and maintenance, as well as standardization, inventory control, and reduction of machine tool idle time. This article shows how this plan worked out in practice and some of the benefits derived from its application to a wide-scale manufacturing plant.

combination of fundamental motions that compose a particular task common to many jobs have been established and the total time computed for these motions becomes a predetermined time standard used whereever applicable.

The many different time elements comprising the overall operation are itemized on a time computation form, Fig. 4, which applies to a particular group of machine tools. Time standards for certain operational steps common to many operations are printed directly on the form. For example, the allowance of 2.7 time-units for moving jaws of a scroll chuck. Machining times are calculated from speeds and feeds prescribed on standard data sheets such as shown in Table I. When total pure and set-up times have been computed, they are written in on master route cards, a copy of which accompanies the work through the shop.

Worthington tool and methods engineers have advocated and used predetermined time standards, but have found greatest benefits are possible only with the long life and repeated uniform performance of carbide tools. These engineers point out that no matter how efficiently a standard setter applies basic motion-time standards, the benefits are limited when frequency of tool changes cannot be anticipated, when the operator has the option of selecting machine speeds and feeds by trial and error, and when rapidly dulling tools must be constantly reset. Expertly ground carbide tools, properly selected and applied, eliminate these factors. With carbides, the time required for actual machining can be accurately forecast.

The carbide application phase of the Triple C program is five-fold: (1) Machine setup, including selection and proper handling of carbide tools; (2) follow-up on tooling applications, which in certain departments are almost exclusively carbide. (3) Troubleshooting, in the event of carbide tool breakage, too frequent tool changes. (4) Training of personnel in proper handling and use of carbides. (5) Maintenance of suitable machine conditions.

In the lathe department, particular attention is paid to chip control with adjustable mechani-

cally-held chip breakers when the cuts run as deep as $\frac{1}{2}$ or $\frac{5}{8}$ in. through heavy scale.

Worthington's plant at Harrison fabricates all single point carbide cutting tools and some multiple-point tools in a centrally located Carbide (Tool Manufacturing) Dept. About 1200 new tools are manufactured and 500 tools are retipped each month. Between 500 and 600 are ground each day, including both new tools and those returned for reconditioning. All this work is handled by 51/2 men. Two work on sawing, milling and grinding shanks and some bench operations; one does all brazing and the remaining bench work; one on the day shift and one on the night shift do all carbide grinding except for chipbreakers, which on the day shift are ground by one man who spends half his time on this work and the remainder on multiple-point tools.

Six Cost Cutting Steps

Among the cost reduction measures taken in the fabrication of carbide tools are the following: (1) Use of predetermined time standards and routing cards, which originate in the Methods and Standards office just as for machine shop production; (2) use of straight line production methods; (3) grinding only the lower side of the shank on the majority of tools to provide a locating surface; (4) slab milling of seat for the carbide tip and brazing the tip on one side only and slightly at the back end; (5) casting as many tool shanks as possible, using facilities of the plant's foundry and pattern shop; and (6) standardization of design, using a minimum number of different shanks, and using 17 standard carbide blanks for about 90 pct of all tools.

Shanks are normally cast in quantities of 200 or more. The surplus shanks are held in stock for the next order of the same shank size and style. The work order is sent to the foundry in time to allow its being held until the specified material is being poured for a major order. This helps reduce the tool unit price.

Cast iron shanks include both straight and offset styles. They are cast to exact size and shape with all clearance angles included, thus reducing subsequent machining. Usually, the only

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remaining operation is slab milling the seat for locating the brazed-on carbide tip.

Other shanks are machined from cold rolled and heat-treated alloy steel bar stock. Cold-rolled steel is used for small side tools and for tools in boring bars and boring heads where there is sufficient support. Alloy steels are used in tools designed for steel and alloy turning. Tool manufacture is handled in job lots, following straightline production methods. Tools are painted on the end according to a color code system: Red for machining cast iron; green for steel; blue for stainless steel, etc.

Because of the extensive area occupied by manufacturing activities at this plant, storage and distribution of carbide tools are handled at three levels. Carbide tips, as received from the supplier, are stocked in and distributed from the main store room. Carbide-tipped tools are fabricated for a particular department and are divided into reserve and active stocks. The reserve stock is stored in the carbide tool crib. The active stock of tools, a limited quantity of each tool used in a particular department, is stored in the respective departmental cribs.

The supervisor of stores is responsible for the storage and disbursement of all purchased, in-process and finished material kept in inventory, and the requisitioning of such materials. This includes responsibility for the main store room, where standard tool blanks are stored.

When a shop order is received by the carbide tool manufacturing department for the fabrication of carbide-tipped tools, the clerk in charge of the carbide tool crib writes out a stores disbursement ticket requisitioning the required carbide blanks. The attendant in the main store room pulls these blanks from his stock, and initials the stores disbursement ticket, which goes to an inventory clerk in the supervisory of stores office. This clerk notes the disbursement on a perpetual inventory record for this item, enters the unit price on the stores disbursement ticket and sends it to the cost accounting department where the charge is made against the tooling account of the department ordering the tools.

The perpetual inventory record used in combination with the purchase record, shown in Fig. 5, provides the means for close, accurate control on all standard carbide blanks stocked in the main store room.

All Data Appears on Cards

Each inventory card has a visible margin, within which is the essential identification data for rapid selection of the desired cards. The purchase record card carries data on carbide grade, materials it is to be used on, suppliers, blank size, inventory period, consumption figures, etc.

When new blanks are requisitioned, the purchase order number, date, quantity, and requested shipping dates are written on the purchase record card and when a shipment is received, the quantity, total price, and unit price are posted on the purchase record and on the perpetual inventory card.

Minimum and maximum quantities have been established for each standard carbide blank. When the inventory falls to the minimum figure, a new supply of blanks is ordered. To provide a more even supply flow, the supplier is requested to make partial shipment in specified quantities on several different dates.

Periodically, inventory and activity records are examined to ascertain whether any particular tool blank is no longer in demand. It may be

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Fig. 4—These time computation forms are used with the aid of standard data in establishing allowed pure time and setup time for the various machining operations.

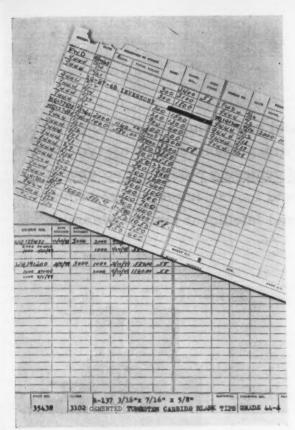


Fig. 5—Visible files house the perpetual inventory and purchase records. Such records are economically and easily set up and maintained, and help provide rigid control of tool stocks.

found that a grade of carbide is no longer being specified or that design changes no longer call for a given size. The supervisor of stores must then determine how the balance on hand can be salvaged, by using them on smaller tools.

Accessory to the carbide tool manufacturing department, the carbide tool crib is attended by a clerk who works continually on the requisition of tool materials and the storage and distribution of carbide tools. When the reserve supply of any tool number becomes low, the foreman of the using department must originate the work order for renewal of the supply. The tool fabrication order is filled out in triplicate, the first and second copies going to the tool and equipment engineer's office and the third is for the foreman.

The tool and equipment office approves the order, designs the tool if it is new, clips a blue-print of the tool with any revisions included, and sends the first and second copies with the blue-print to the carbide tool crib. There, the order is entered on the clerk's records, a carbide order number is assigned, and the tool print and first copy of the order is sent to the methods and standards department, while the second copy is sent to the shop foreman. If several departments order the same tool, the orders are grouped, for one work-lot fabrication.

The shop foreman replaces the third copy of the order in his files with the second copy, which provides the carbide order number. Methods and Standards sets the established time standards for the tool, giving consideration to any revision in design, and returns the tool print, order copy No. 1, and a routing card or shop ticket to the crib.

The crib attendant orders the carbide blanks from the main store room on a stores disbursement ticket if standard blanks are required. A limited quantity of standard blanks and about 50 miscellaneous carbide blanks in small quantities are stored in the carbide tool crib for replacement purposes only. The crib attendant also orders the tool shanks from the foundry.

When the required shanks and tips are received, the tool print, fabrication order, and shop ticket go to the carbide department foreman, who schedules the work for production.

This shows for each particular tool number the initial job quantity, the departments ordering the tool, and the full bin location and quantity of tools put into reserve for each department. By periodical count, the attendant can check when the stock is low.

The tool crib in each department is the responsibility of the department foreman. Only he, his sub-foreman, and the toolrunner of the department have access to the tools. The crib houses a small active stock of all standard carbide tools used; standard multiple point tools; and special cutting tools, standard tool holders, fixtures, and other tooling accessories.

On each new job, the usual practice is to provide two complete sets of all single point carbide tools required. The tool runner picks up a set when dull, takes them to the central grinding room for reconditioning, and picks them up later for return to the same machine.

When a replacement for a broken tool is requested by an operator, the runner is required to report this to the foreman or sub-foreman, and have his permission before drawing the tool from the department's crib. The operator is not charged with tool breakage, although the foreman or sub-foreman immediately investigates the cause of such breakage to prevent its recurrence.

When tools are withdrawn from the department's active stock to replace tools withdrawn from service, new tools are at the same time drawn from the reserve supply in the carbide tool crib for renewal of the active stock.

Damaged tools are not scrapped, but returned to the carbide department foreman, who decides whether or not they can be salvaged. If some modification or retipping can renew the service-ability of the tool, either as the original number or another tool of smaller dimensions, the cost of modification is charged against the department and the salvaged tool added to the department's reserve stock.

Since all tools are ground to print specifications, any desired change in tool grind or design must be requested in writing by the foreman.

Tool Engineers' Notebook

Practical cost saving ideas for the tool engineer are presented here as typical methods of achieving production economies through good tooling, improved production methods, and intelligent product planning.



JOB

Harden specific areas of shafts.

PROBLEM

Accomplish this hardening at low cost and without distortion.

SOLUTION

The areas that required hardening were heated by the Tocco induction heating process. Since only the parts to be hardened were heated rather than the entire shaft the distortion problem was eliminated. A production of 70 shafts per hr was obtained using 100 kw.

SAVING

The cost of hardening each shaft was reduced by \$2 when Tocco replaced conventional heat treating methods. The redesign of the shaft made passible through use of this heating method reduced the shaft weight by 12½ lb.

Data courtesy Ohio Crankshaft Co., Cleveland

JOB

Rough and finish bore two diameters in an SAE 4640 steel clutch cage. Part had hardness of Rc 35 to 40.

PROBLEM

Provide for multiple operations with one tool to increase output of machine.

SOLUTION

A special Madison Boreamer, incorporating one raughing cutter and one reaming cutter for each diameter was designed. This amounted to a total of four cutters all held in one bar.

SAVING

Output of machine increased by 50 pct.

Data courtesy Madison Mfg. Co., Muskegon, Mich,



JOB

Process cluster gears for truck and automotive transmissions.

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PROBLEM

Difficulty in maintaining concentricity between the shaft hale and the gear teeth. The hole is several diameters in length. The practice had been to finish only a section about 1/2 in. long at the end of each bare to serve as bearing surfaces for the needle bearings on which the gear ratares. Production by the old process was 200 gears per 8 hr per machine.

SOLUTION

OLUTION

The Microhoning process was used to generate and finish the shaft hole. A double-spindly Micromatic hanger with automatic control and ratary indexing table was installed. The full length of the hole is now Microhaned to within 0.0003 in, accuracy. The teeth are cut concentric with the bore. The gear is carburized and hardened. The bore is then finish haned to correct any distortion caused by the heat treat and to develop the required finish.

SAVING

Production was increased to 1200 gears per 8 hr per machine. In addition to improving the quality of the gear and increasing production, the new method made passible a net saving of over \$0.10 per gear.

Data courtesy Micromatic Hone Carp., Detroit.

JOB

Grinding chip breaker grooves in tungsten carbide tipped tools.

PROBLEM

Find a grinding wheel with longer wear qualifies than standard resincid banded diamond wheels, and one that does not need constant redressing. The life of resincid banded diamond wheels was from 500 to 700 chip breaker grooves.

SOLUTION

Wickman - Novin steel bonded chip breaker diamond wheels.

SAVING

Wheel live was increased more than ten times. Wheel dressing was entirely eliminated. Grooves from 0.020 to 0.040 in. in depth are now ground in one pass. Former depth of feed was about 0.0005 in. The grinding time was reduced to about 1.5 min.

Date courtery Wickman Mfg. Co., Detroit.



JOB

Finish grinding 3% in diam culters of 0.0007-in, thickness to with a tolerance of 0, 0.0001 in Surface finish not to exceed 8 micro-inches between highest peak and lowest valley.

PROBLEM

To find accurate and reliable means of controlling size while removing stock. Close tolerances ruled out the use of contact gaging devices because of sludge accumulation under contacts, and possible transfer of machine vibration to the gage.

SOLUTION

A Taft-fiberce CampAiRator air gage was selected. Accuracy of readings were unaffected by coolant flow over work. Air jets prohibited sludge accumulation. The gage diel was set with master gage blocks in finish cutting, when the pointer moved to within marked tolerance span on the gage dial, the finished size was loached.

SAVING

Comparison with previous production method indicated that productivity increased 25 pct and spoilage was reduced from 20 pct to 1.5 pct. Net production increase was over 50 pct.

Data courtesy Tatt-Pierce Mtg. Co., Waonsacket, R. J.



JOB

Shear flat stock in a power shear.

PROBLEM

Reduce number of grinding operations to keep power shear knives sharp.

SOLUTION

Carmet carbide blades were installed in the power shear. Blades were attacked to hardened, high-carbon high-chrome, tool steel holders by means of four headless screws in counterbered holes.

SAVING

Operational results proved that these blades stay sharp at least 40 times longer. After shearing 352,000 pieces the blades needed no regrinding.

Date courtesy Allegheny Ludium Steel Carp.,

IOR

Funch holes in metal sash

PROBLEM

find a better method of punch lubrication. Every 10 strakes, the row of punching tools was hand diled.

SOLUTION

A Norgren labricator and 12 lowpressure needle valves were installad on the gang punch press. The foot trip actuates a valve that releases air through the lubricator to each punching tool and spring-type tripper. Each tool is automatically labricated with an eir-oil fog for each punch strake.

SAVING

User claims 30 pct increase in output and 50 pct longer life for punching tools.

Data courtesy C. A. Norgien Co., Denver

JOE

Increase machine tool efficiency.

PROBLEM

In machining allay steel for heavy-duty truck parts, cutting oils were tested for various machines such as screw machines, gear cutters and broaches. These oils smoked and had objectionable odars, tool life was only fair, and rejects were frequent because of poor part finish. Some operators complained of skin irritations.

SOLUTION

A Sunicut grade of cutting oil replaced the three grades in use, Smoking caused by overheating was eliminated, finishes improved, and tool life was increased by as much as 50 pet on some machines. Bad odors and skin irritations were eliminated.

SAVING

Inventories of cuttings oils have been reduced and savings of about \$8000 a year have been made in time, maintenance, and all costs. Data courtery Sen Oil Co., Philadelphia.

JOB

Cleaning hardened tools, punches and dies after beet treating.

PROBLEM

to clean precision parts without exposing them to excessive surface wear.

SOLUTION

A Danavan Water Blast Hydre-Finish cabinet was installed. Air pressure of 125 psl and water under pump pressure shot 5000-mesh abrasive particles at parts. Less than 0.0001 in, of surface was removed from die ar punches being cleaned.

SAVING

Grinding time cut by 50 pct: polishing and finishing time on hobs and cavity melds cut by 60 pct; clogging of grinding wheels eliminated; less wheel dressing; longar wheel life.

Data courtesy Denavas Co., Philadelphia.



Continued on Page 200

Cutting Costs -

By Standardizing

TOOL MATERIALS

The Westinghouse program of tool material control and standardization embraces purchasing and inventories, heat treating, machining and other factors bearing on the choice and use of tool and die steels.



By E. GRIFFITHS

Consulting Manufacturing Engineer,
Headquarters Mtg. Engineering Div.,
Westinghouse Electric Corp., Pittsburgh

A PRODUCTION program is only as efficient as the production tools involved, and these tools in turn are only as effective as the intelligence and planning that go into their design, manufacture and utilization. Realizing that standardization plays an important part in the successful operation of a tooling program, the Westinghouse Electric Corp. has included tool steel and tool material standardization as part of a company-wide program encompassing production tools of all types in all manufacturing divisions.

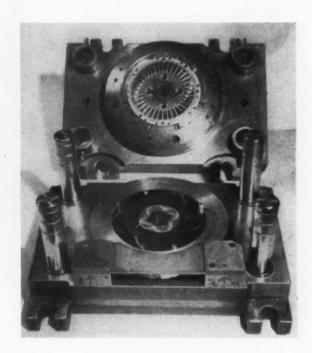
The aims and purposes of this phase of the program are five fold: (1) Control inventories of tool steels; (2) establish tool steel grades; (3) determine standard sizes to be stocked; (4) control incoming tool steel to Purchasing Dept. specifications; and (5) provide data from which heat treating specifications can be compiled. These functions are performed under the guidance of an advisory group known as the Tool Steel Committee, which numbers among its members representatives of the Research Laboratories, Mate-

rials Engineering Dept., Engineering Standards, Purchasing, Headquarters Manufacturing Engineering, and production and manufacturing personnel of the various divisions of the company. Separate groups, or subcommittees, are devoted to each of the five subjects mentioned.

In any tooling program, the tool steel cost is the smallest item of expense. Fabrication of the steel into tools, the equipment used, the hours of productive labor expended, and frequently the actual cost of the workpiece far outweigh the cost of the tool material. However, in a corporation that spends literally thousands of dollars annually for tool steel, inventories are a major problem.

In this connection, a "Controlled Stocking Program" has been instituted in a successful attempt to derive some of the benefits of buying tool steel in mill quantities. The particular manufacturing division that uses the greatest quantity of a given tool steel will stock the major portion of the total company inventory, and other plants will draw on this supply as the need arises. In

FIG. 1—The Westinghouse tool standardization program encourages the use of new materials. Even though initial cost was considerably greater, this tungsten carbide die replaced its tool steel predecessor. Relative cost and performance data are shown in Table 1.



this way it will be possible to take advantage of quick deliveries, favorable prices and reduced handling costs. Yet no division will be burdened with an unnecessarily large inventory. The plan also calls attention to slow moving and obsolete stocks which will be eliminated.

Closely allied with inventory control are the matters of tool steel grades and sizes to be standardized upon. The tool steel producers have developed and are continuing to develop their products to such an extent that there are many grades available. The problem is to select the minimum number of tool steel grades and sizes to apply to the maximum number of applications.

Or, to express it in a slightly different manner, it is desired to obtain the best steel that manufacturers offer for various applications having to increase inventories unduly, and to be consequently confronted with more complex heat treating requirements. The steels included in the standards are believed to be sufficient in number to meet practically all needs throughout the company. With few exceptions, it is possible to employ standard steels by making slight modifications in the tool design or heat treatment.

An indication of the results achieved since the program started can be readily had by merely checking tool steel stocks. In 1940 there were 1877 grades and sizes of tool steels stocked in the major manufacturing divisions. By 1949 this number had been reduced to 370.

Steels that have been standardized upon are not purchased by trade name, but by specification number only. Purchasing department specifications for each grade of tool steel are compiled by the materials engineering department in accordance with the recommendations of the tool steel committee. All purchases are made on the basis of these specifications.

The purchasing department specification, which includes inspection and testing of the tool steel, is placed in the hands of all suppliers whose products have been established as satisfactory and who have agreed to meet the requirements set forth. A raw materials inspection guide lists laboratory tests to be made on incoming materials, and the plant metallurgical laboratories follow this procedure.

Care is exercised in the adoption of quality standards to make certain that only after careful study is a new grade of steel accepted. It is studied from the following standpoint with respect to the desired application: (1) Hardness, both degree and depth; (2) toughness; (3) abrasion resistance; (4) impact and heat resistance; and (5) deformation or distortion.

The testing is generally performed under laboratory conditions so that errors that might be present in manufacturing operations can be eliminated. However, under the guidance of skilled personnel, tests can be carried on in actual production with good results. If the final tests justify the adoption of a new grade of tool steel, specifications are recommended and the applications for which the steel is best suited are suggested. A tool steel number is assigned by the tool steel committee, and the materials engineering department obtains the necessary data for the preparation of purchasing department specifications.

Continued

Typical of the testing performed prior to the acceptance of a new tool steel as a standard grade is the work that has been done in connection with a high-carbon, high-chromium steel. Widely advertised as being a grade suitable for die applications, the steel was put to use in a number of Westinghouse manufacturing divisions. It was found that the steel is difficult to grind, and that grinding stresses give rise to cracks in the dies. Considerable work has gone into a study of this problem in an attempt to develop a process specification that will strain relieve the dies after grinding.

In addition to conventional strain relieving practices, a treatment has been devised that involves a strain relieving period of 24 hr at 212°F in a circulating air furnace or clean water immediately after hardening. Although results are not yet conclusive, the process shows promise.

COMPARISON OF COSTS AND PRODUCTION

	Old Method	New Method	Increase, Pct
Cost Factors: Cost of Material, \$ Tool Construction Cost, \$ Total Cost of Tool, \$ Material, Pct of Total	350 3,150 3,500 10	1,070 5,930 7,000 16	200 88 100
Production Efficiency: Total Productive Capacity, Hr	2,170	27,700	1,200

This strain relieving practice is also vitally important for reground or refinished tools and dies. However, since production demands may not permit a long treating period that would be tolerable in the case of new tools, it has been determined that such a treatment for any length of time is beneficial. Practices and experiences will be thoroughly reviewed before a final recommendation concerning application of this steel is made.

Tungsten carbides, cast alloys and other tool materials are being used extensively where justified, but tool steels still play the predominant role in Westinghouse tools and dies. While the carbides will frequently give 10 to 20 times the production of conventional tool steels, such materials may demand production quantites and/or equipment requirements that in some cases are prohibitive. Results of a typical carbide application are shown in Fig. 1 and Table I. Also illustrated is the relative insignificance of tool material cost. An increase in production of

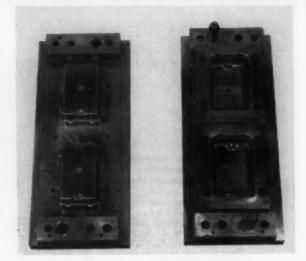


FIG. 2—Material used in this plastic mold represent's only about 12 pct of the finished tool cost. Any new tool material that shows reasonable promise of improving the cost picture is studied.

1200 pct, as shown in the table, left, justifies using a material that had a 200 pct increase in cost. Where cost and productive efficiency are similar, it is necessary to examine all savings that may accrue from die setting, grinding and repairs.

There is a continuing search for a general purpose tool material at a justifiable price that will give a moderate production increase over conventional tool steels and be adaptable to existing equipment. Figs. 2 and 3 show other tools where material cost is only a small part of tool cost.

Single point carbide tools are generally accepted as good practice when equipment and

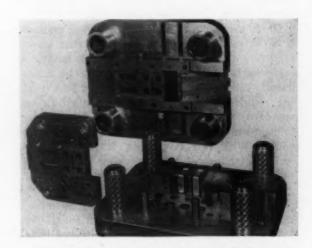


FIG. 3—The material in this progressive type die for "E" and "I" laminations was only a small part of the total die cost. Westinghouse is searching for a tool material at a justifiable price and adaptable to present equipment that will give a moderate production increase over present tool steels.

TOOLS-STEELS AND HEAT TREATMENT

· NAME OF TOOL	LOWA	CTIVITY	HIGH ACTIVITY		
NAME OF TOOL	STEEL	H.T Nº.	STEEL	H.T. Nº.	
DIES-SH, METAL-GENERAL-CONTOUR NOT GRO	21 T.S.	21-2 on 21-1	15 T. S.	15-IA OR 15-1	
" " " GROUND	21 T.S.	21-8 on 21-7		5-4Am5-	
" LAMINATIONS-SILICON-NOT GROUND			15 T.S.	lie .	
" LAMINATIONS-SEMMHARD PARTS-NOT GROD	21 T.S.	21-	QUENCH:		
" LAMINATIONS-SILICON-NOT GE		NONE	15 T.S.	ID-IAMID-4-I	
" LAMNATIO"	2001	202			
LAM COPPER & BRASS	2081 20.84	202			
FOR .02 MAX. ALLUM. COPPER & BRASS	2001	203			
CHROME PLATE .0005 TK, CHROME PLATING INCREASES DIE LIFE 8	PREVEN	rs "Plak UP"	& GALL	ING.	

FIG. 4—From these tool steel designations, a tool designer can determine by specification number the steel and its heat treatment for any given application.

L. H.T.	ROCK.	PROCESS SPEC.	SHEET NO.	TL. HT	ROCK.	PROCESS SPEC	SHEET NO
2-1	64-66	290642-1	F- 5300-A	18-1	57-59	291163-2	F-5300-G
2-5	30-35	185041-3		18-2	44-46	291163-2	18
2-8	64-66	185041-1		OLD N	0.12 TS.	240108-2	R-5300-
2-12	30-35	185041-3	PS.	19-2	52-58	290218 - 2	R-5300-C
201	90Min	• 185465	R-5300-A	19-3	55-60	290218-4	
3-2	64-66	115421-7	16	19-4	49-52	290218-3	
3-2À	61-64	115421-1		19-5	57-62	290218 - 5	
3-3	54-58	115421-3	98	21-1	60-62	290509-2	F-5300-D
3-4	50-54	115421-4	60	21-2	63-65	290509 1	61
3-6	40-45	115421-6		21-3	57-59	290609-3	
3-6	35-40	115421-9		21-4	55.40	JC809- "	
3-7	30-35	115421-8	er* B	-9		. 40	
3-8	64-66	I IRan			-	1184	1 0
3-9	80-	-		616	43-47	50994-6	
		-	AT'S	221	61-64	115421-1	F-5300-F
	44-31	1 15036 -20		224	87	185484	
11-8	19-24	115036-21		225		290550-5	F-5300-E
15-1	60-62	0 185453-2	R-5300-G	228	SOFT	240094	F-5300-F
IS-IA	65-65	185453-1		227	88Min	* 290519-5	F-5300-E
1548	57-59	185453-3	10	228		290519-2	98.
15-2	53-55	185453-5	- 44	229	FILE HD	# 50999 I	R-5300-E
15-3	37-40	185453-4	-	230	43-46	9 50765-6	10.
15-4	60-62	185453-2	0.	232	47-50	290096	R-5300-F
	63-65	185453-1		233	43-48	291083-2	
15-48	57-59	185453-3		4234	54-57	290701 - 3	
15-5	55-55	185453-6		4235	48-52	290701-4	98
16-6	37-40	185453-4		236	55-58	a 290702-5	

FIG. 5—With the information shown in Fig. 4, reference to these data show the hardness to which a tool must be drawn, as well as the heat treating and process specifications.

Nº. 3 T.S.	1.0		SI. AO MAX.	SIMILAR TO S.A.E. NO. 1095.
SPEC FOR TOOL WORK	HARDNESS ROCK-C-	PROPERT	ES	OPERATIONS
HT. 3-1	90 MIN.	FILE HARD SURFACE. CORE WHEN SECTION THAN APP. W., HARE SECTIONS LESS THE DISTORTION. POOR WESS. NO SHARP (N IS GREATER O CORE IN NN %. LOW NOTCH TOUGH-	I. ROUGH MACHINE. 2 STRESS RELEVE P.S. 15421-12 3 FINSH TO SIZE. A HARDEN TO P. S. 185467 MAT'L. H. T. 3-1 SH ⁷ OROUND AFTP?
HT 3-2	64-66	MAX HARDNESS MIN. SISTANCE AND MIN.		IMACO:
H.T. 3-2A	61-64	BETTER IMPACT RE	Da.	TO P.S. 115421 -9.
H.T. 3-3	54-58	MAX. BEND STRF"	STANCE.	I MACHINE, ALLOW FOR GRINDING. 2. HARDEN TO P. S. 115421-8. 3. GRIND WHERE SHOWN.
HT 3-4	50-50	WESS PE	RMANENCE	I.MACHINE, ALLOW FOR GRINDING. 2.HARDEN TO P. S. 115421-7000"O- 5.ROUGH GRIND. 4. SEASON TO P.S. 240212 - 5.FINISH GRIND. 5-LAP.
HT "	64-66	SAME AS 3-8 EXCE DISTORTION IN HAR		I. ROUGH MACHINE. 2. STRESS RE- LIEVE P.S. II 5421-12. 3. FINISH M -CHINE. 4. HARDEN P. S. II 5421-7. 5. ROUGH BRIND. 6. SEASON TO P.S. 240212. 7 FINISH GRIND. 6. LAP.

FIG. 6—The data in Fig. 5 refer directly to these individual specifications on hardness and machining methods for specific steels.

activity is satisfactory. Carbide milling is used extensively and to good advantage, but it is felt that initial tool costs, maintenance and equipment problems present a need for careful study. Carbides in drilling are receiving serious consideration and are finding wider usage.

Recently the application of carbides in stamping dies has been so successful that at present 14 divisions of the company are making substantial applications and studies. Applications to date include compound and piercing dies for rotor and stator laminations, progressive dies for E plates for transformers, and miscellaneous dies. Early developments in carbides used in slitters on silicon steels indicate great possibilities. Carbide rotor and stator lamination dies and E plate dies cost only about two to three times more than tool steel dies. In return, production has been increased 15 to 25 times and quality is better. Savings have also been realized because of lower costs of die setting and die maintenance, and because of reduced press downtime.

The standards sheets such as shown in Figs. 4, 5, and 6 provide general information for selecting the proper steel for a given application. The steels are divided into two major groups: (1) Those true tool steels that actually serve as cutting tools and (2) commercial carbon or low alloy steels that are utilized as constructed members in conjunction with tools.

A partial schedule of tool steel designations for a variety of applications is shown in Fig. 4. From these data, a tool designer can readily determine by specification number the steel recommended for a given application, as well as the heat treating procedure. This system is employed for all items made of tool steel, including dies, cutting tools, punches, gages, pins, drill bushings, index rings, plastic molds, mandrels and diecasting dies.

Using the information from Fig. 4, the designer can refer to a table such as shown in Fig. 5 and determine the hardness to which the tool must be drawn, the heat treating and process specifications. This information refers directly to individual specifications on hardness and machining for the specific steels, such as shown in Fig. 6.

Tool marking is simplified in that the short numerical designations, as shown in Fig. 5, refer to the tool steel, the hardness range, heat treatment and process specifications. This simple number coding results in a great saving of time and labor, both in tool designing and in marking tool and die parts to insure correct identification previous to heat treating.

The program of tool steel and tool material standardization is not intended to discourage the development of new materials, but rather to study those that are developed and compare them with those already accepted as standard.

Cutting Costs -

By Improved

Heat Treating Methods



By E. J. PAVESIC Metallurgist, Lindberg Steel Treating Co., Chicago

Tools and dies may be of the best material and design, but improper heat treating will ruin them. Tool material selection, tool design and heat treating practice must be considered by the tool designer in his effort to reduce manufacturing costs.

NLY through judicious use of the myriad of tool materials available can the tool engineer attain maximum production with high quality standards at low unit cost. To insure the success of a tool or die the efforts of everyone associated with its manufacture and use must be coordinated.

Tool material selections are based on a number of factors, such as the material being formed, blanked or machined; the volume of production desired; and design of the tool. However, for any tool material, heat treating will vary with design, and the selection of material, tool design and heat treatment must be considered simultaneously.

The analysis of the selected tool steel should conform to established standards. High chemistry heats as well as low chemistry heats may be detriments to successful heat treatment. Hardness, depth of hardening, size change and warpage can be affected by variations in analysis. Propensity to cracking may also be increased by improper analyses.

The tool steel should be free of physical defects such as seams, rolling or forging laps, and breaks on the surfaces since these defects are potential focii for cracking during heat

treatment. Internal defects such as piping, forging bursts, flakes or ruptures are more difficult to detect and yet are serious offenders in the cracking of parts during heat treatment.

On one occasion, a large forged 8-in. diam solid reamer of high speed steel was submitted for hardening and, to facilitate uniform heating and cooling during hardening, a hole was drilled through the center. The drill, after penetrating several inches, dropped several more inches through a forging burst no one had suspected was present. It so happened that the final size of the drilled hole was larger than any portion of the forging burst. Therefore, the inside diameter was cleaned up completely and the reamer was successfully hardened. Had not the hole been drilled, the reamer undoubtedly would have shattered during hardening, with subsequent lost time and money because of a bad forging and poor design.

Severe carbide and alloy segregation at the center of a bar also may act as focii for cracking, especially when exposed to a surface in a longitudinal plane.

Decarburization in a rolled or forged bar is harmful in several respects, first because it alters the maximum hardness attainable, and

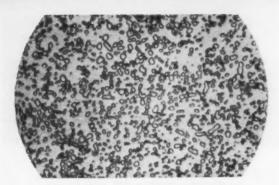


FIG. 1—This annealed microstructure (500X) of a 1.00 pct carbon tool steel is desirable for tool steel prior to hardening.

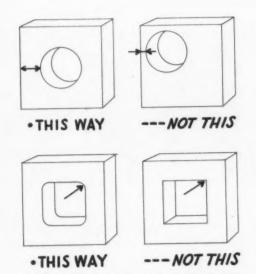


FIG. 2—Sections should be equalized to permit uniform stress distribution during heating and quenching. Hardening failure is minimized by filleting to eliminate notch effect and stress cracks starting from corners.

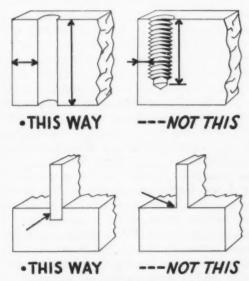


FIG. 3—Blind and tapped holes should be avoided and all holes should be as far as possible from edges. Successful design calls for inserts where thin walls or deep impressions interrupt the continuity of cross-sections.

second because the transformation or hardening characteristics of the decarburized layer differ from that of the parent metal. In addition, when present in thin sections, decarburization increases the amount of warpage in heat treatment. There is only one remedy for decarburization and that is its removal before heat treatment.

Tool steels should be in a fully annealed condition before hardening. The microstructure should be 100 pct spheroidized, as shown in Fig. 1, providing maximum machinability and the best possible control of the solution of carbides when heating for hardening. Wear resistance, hardness and dimensional changes may be adversely affected and cracking hazards increased if the steel is not fully annealed.

The tool designer has additional responsibilities when designing tools that require heat treatment. Generous filleting should be provided at changes in section and sharp reentrant angles should be eliminated. The greater the symmetry of a tool, the less hazardous is its heat treatment. It is not uncommon to drill holes adjacent to those already present in blanking dies to provide for greater uniformity in heating and cooling during hardening. The use of sectional dies simplifies heat treating problems and eases the problems of machining and grinding for the tool maker. Some design suggestions are shown in Figs. 2 and 3.

In designing and producing tools and dies, certain dimensional tolerances are generally permitted although sometimes they may be quite small. Many parts are finished to size before heat treatment, necessitating exacting control to prevent or minimize growth, shrinkage and distortion.

Growth, shrinkage and distortion are functions of the analysis of the material, design and heat treating technique. Distortion can result from differential heating or improper support while heating for hardening. Growth may result from the change in volume that occurs when steel is hardened or from permanent deformation as a result of differential heating or cooling. Shrinkage is affected also by differential heating or cooling.

Size change experiments on test rings of a chromium tungsten oil hardening tool steel indicated that size change was a function of cooling rate when these rings were martempered, oil quenched and brine quenched.

To successfully harden tools and dies, the heat treater must first have the proper equipment. Heating for hardening is done best in controlled atmosphere furnaces wherein the carbon potential in the furnace is neutral to the carbon content of the tool steel or in neutral salt baths. Both methods eliminate carburization, decarburization and scaling. (See Fig. 4.)

This controlled heat treating may seem

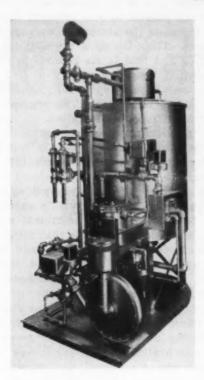




FIG. 4—Modern endothermic generator for the production of neutral atmosphere, left. Modern atmosphere controlled furnace, incorporating preheat, high (hardening) heat and quench zone, for steels susceptible to hardening by slow cooling, below. Typical neutral salt bath furnace, above.



costly, but any tool failures resulting from improper heat treatment are similarly costly.

Hardening temperatures should be the minimum necessary to attain the hardness desired. The use of excessive temperature and/or time will usually result in excessive carbide solution and possible grain growth, which increase cracking hazards and tend to decrease die life. Greater instability may result from austenite, which may be retained at room temperature as a result of overheating or oversoaking.

The heating rate of any tool should be kept at a minimum to prevent excessive or differential movement during heating for hardening. Preheating during hardening is good practice.

The selection of a quenching medium is dictated by the analysis of the material and the design of the tool. Water hardening tool steels in small sections can be effectively hardened in oil. Large parts made of carbon tool steels can often be time-quenched in water, then transferred to oil to minimize distortion and cracking hazards.

Low melting point niter salts and high temperature quenching oils are extensively used in martempering or interrupted quenching to minimize distortion and quenching stresses. In martempering, the quench is arrested at or slightly above the temperature at which the martensitic transformation begins and the part is allowed to equalize at this temperature. The actual hardening is accomplished by air cooling from this temperature.

In a tool, the temperature gradient between

the surface and the interior will be less in oil than in water and less in air than in oil.

The tool or die should be thoroughly hardened before tempering. This means that the part should be allowed to transform almost completely to martensite before tempering; otherwise some hardening may take place after tempering. Since the martensitic transformation for many tool steels is essentially complete at 100° to 150°F, tools should be cooled to at least this range before tempering. For maximum stabilization with commensurate hardness, tools should be tempered for long times at temperatures of 350° to 400°F. With high speed steels, a double tempering operation should be performed since such steels exhibit secondary hardening characteristics. Indeed, it would be desirable to double temper any tool steel as long as hardness is not sacrificed.

Straightening is one of the more hazardous operations the heat treater must perform. It is preferable to straighten the tool or die before it has completely transformed to martensite or, if possible, before transformation has started. The transformation characteristics of the steel must be considered when straightening. Hot straightening from the martempering bath is a good technique.

The importance of coordinating the various phases in the manufacture of a tool or die cannot be over-emphasized. The tool engineer who will take into consideration these variables when designing a tool or die can produce tools and dies at minimum cost.

Cutting Costs -

By Form Cutting

PRECISION GEARS

Used for the first time for internal toothed gear parts, two Shear-Speed gear shapers are doing the work of 12 single-spindle and six 8-spindle gear generating machines.

I N putting automatic transmission into mass production, Packard Motor Car Co. uses only two machines to cut the internal non-rolling gears of a 12-in. diam hydraulic cylinder housing and the mating toothed contours of the pressure plate and hydraulic piston. The total machine cycle time in producing a complete set of three gears is 48 sec. The setup is characteristic of the numerous developments in manufacturing methods to reduce costs, which recently enabled Packard to drop the price of its automatic transmission some \$40.

The parts are shown in Fig. 1. The internally toothed part is the cylinder; the externally toothed part with the smaller bore is the hydraulic piston that slides in this cylinder; while the third part is a pressure plate used to seal the housing. Teeth are all stub tooth involute, and alternate pairs of teeth are machined off the pressure plate and piston at the same time that the teeth are cut.

Using conventional cutting methods, some 12 single-spindle gear generating machines and six 8-spindle gear generating machines would have been needed to give the production rate required. The two machines used are Michigan Tool Shear-Speed gear shapers. Equipped with radially fed form tools, these machines cut all the teeth either in a cylinder or around a pair of pressure plates or a pair of piston plates in 24 sec machine cycle time, each.

It is believed that this is the first time a machine of this type, shown in Fig. 2, has been used in mass production of internal gears or forms.

Operation is similar to that of the Shear-Speed for external gears. Form tools are radially arranged and are fed outward before

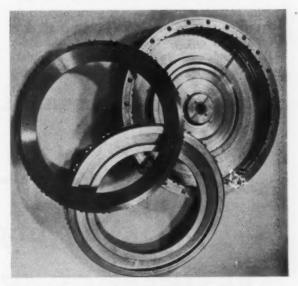


FIG. 1—The gear teeth on these three parts for a Packard transmission are cut on two Shear-Speed gear generating machines. This is believed to be the first time this type of machine has been used for cutting internal gears.

each stroke of the arbor carrying the work. Before the return stroke, they are retracted inward slightly to clear the work. As the form tools approach full depth of cut, feed is reduced from 0.005 in. on radius to a finishing feed. When final depth is reached the machine makes three more clean-up strokes. The head then retracts and the machine stops for reloading. Clamping is hydraulic and semi-automatic.

Output of pressure plates or piston plates by the external-gear *Shear-Speed* is 200 to 240 per hr. Tools for the two parts are not interchangeable because of differences in the root diameter of the teeth. More metal is removed on the piston plates to provide a sliding fit within the cylinder. Practice at present is to run a stock of either pressure or piston plates and then change the machine over for cutting the other part. Changeover time is about the same as for a conventional single-spindle gear cutting machine, about 1/12 the output capacity per hr.

Production of cylinders on the internal gear machine is slightly lower because of a longer loading time allowance, output averaging around 85 to 90 pieces per hr. The part is loaded in a pot-chuck, from which it is partly ejected vertically at the end of the machine cycle, for easy removal.

Tool life on the external gear machines is such that tool maintenance cost is estimated by Packard tool engineers at about 1/10 that for generating tools for the same production. At the time these data were obtained no estimates on tool life were available on the internal gear machines as the tools had not worn sufficiently to require regrinding. About 5000 parts had been turned out by the machine at the time.

When tools require sharpening, the complete set of these single point form tools is simply

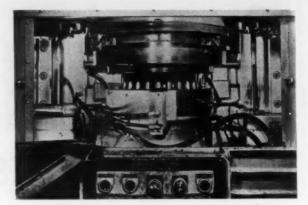


FIG. 2—In cutting the gear teeth of the cylinder, form tools are rearranged to advance and retract at the beginning and end of each stroke for clearance. Feed is reduced at the end of the cycle for finishing and clean-up.

locked together, placed on the magnetic chuck of a surface grinder, and about 0.005 or 0.006 in. is ground off the top face of all tools simultaneously. No other grinding is required.

The parts come to the two gear generating machines off two batteries of three Bullard carbide-tooled, multiple-spindle facing, turning and boring machines, three Mult-Au-Matics feeding each *Shear-Speed*. Actually this leaves some reserve production capacity for the gear cutting machines.

Cutting Costs -

By Improving

RESISTANCE WELDING TOOLING



Resistance welding jobs should be evaluated according to type production required, and overall costs ton standard tooling as compared to special tooling.

By CLARENCE C. BRONER

Application Engineer, Sciaky Bros., Inc., Chicago

ANUFACTURERS of metal products recognize that resistance welding has permitted higher production of a better product at lower cost, but not all manufacturers realize how the cost of resistance welding can be further cut by correctly designed tools and fixtures.

Where production requirements justify the cost of special fixtures and tooling, part handling time can be materially cut. Some of these tooling aids can be used on standard resistance welders. With tooling designed especially for a definite purpose, much time can be saved in clamping parts and bringing them to and from

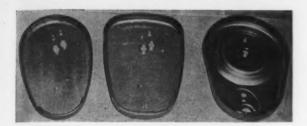


FIG. I—Three different base units welded on the Sciaky MG-5 automatic welder.

the welder, as well as assuring accurate alignment of all components in the welded assembly. Where the nature of the welding necessitates special provision for locating, clamping or welding the subject parts, completely special machines may be required for maximum productive efficiency.

Every resistance welding application should be evaluated according to the nature of the problem, the production requirement, and the overall cost based on completely standard tooling, as compared to the cost of completely special tooling designs for the particular application, with the reduced costs as defined in productive, man-hour per piece part assembly.

Modern resistance welding equipment, with its positively timed accurate control of the electrical and mechanical sequence of mechanical and electrical functions, makes possible the incorporation of other mechanical and/or electrical tooling functions such as indexing, shuttling and hopper feeding. In many instances the welding machine control can readily be changed to incorporate the control functions of such additional tooling.

High production resistance welding applications with intelligently conceived and properly designed tooling will increase production by as much as 500 pct and give a more uniform product with better weld quality, since all factors are automatically controlled. Properly integrated equipment and tooling has often increased production and improving appearance.

For example the Alpha Products Co., Chicago, originally fabricated a line of metal mixer bases with foot-operated welding machines. These bases, shown in Fig. 1, are made in three different sizes and shapes, requiring two stamped metal retaining clips to be spotwelded at ten locations to each of the inner curved surfaces of the bases. The show surfaces of these bases must be smooth and without any spot indentation. To do this job, two operators were required; one to load the fixture that locates and holds the retaining clip to the base unit, and the other to perform the welding operation. Using a small foot-operated welding machine with two operators, a maximum production of 125 units per hr was obtained, providing the operators worked at peak efficiency. In addition, grinding and buffing were required to smooth the show surfaces that later received the finish lacquer coats.

When it became apparent that the joining of these parts would have to be stepped up, the production engineers had to decide whether:
(1) To purchase additional spotwelders and train new operators; or (2) to use a high speed multiple electrode welder that would do the job in one operation.

The company's engineers, in collaboration with Sciaky engineers, decided on the multiple welder. That the decision was justified was borne out by the results of this machine in operation. The same two operators were able to weld more than 520 units per hr as compared with 125 units formerly produced on the foot operated welder. Also, buffing and grinding were unnecessary because of the proper design of welding guns and fixtures.

The machine is basically a table-top welder with ten adjustable, self-centering hydraulic welding guns. Five series welding transformers are used, with the electronic control cabinet mounted separately on the wall near the welder. The fixture that locates the retaining ring and base unit is adjustable to accommodate the various sizes of units. In operation one operator places the retaining rings in the respective fixtures while the other puts the base unit in

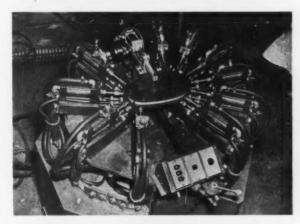


FIG. 2—Parts are loaded directly on the machine. Operators are able to work more efficiently with less fatigue.

the welder and depresses a control button that initiates the welding cycle. All ten welds are made in one operation. Fig. 2 is a closeup view with the work in welding position.

The intelligent application of resistance welding, coupled with correct tooling, as the foregoing example shows, can be a definite advantage in an infinite variety of production fabricating problems. It is to the tool engineer's advantage to consult the manufacturer of welding equipment so that recommendations can be made in up-to-date welding techniques and possibilities of increasing production and lowering unit cost.

Cutting Cost's -

By PLANNING



TOOL MANUFACTURE

Careful analysis of store room, tool room and production floor operations means better methods that boost production and cut costs.

By GEORGE S. CLARKE
Northern Electric Co., Ltd., Montreal

OST cutting methods can extend beyond the design stage through the specific steps of tool and fixture production and operation. Store room, tool room, and production stations may reveal a variety of operations that may permit the use of better methods or procedures, with resultant reductions in cost.

Transportation, stock handling, machine setup and operation can all be improved and materials saved by having well trained operators and by equipping the stock room with good power hack saws, abrasive cutoff machines and metal band saws. By keeping these machines in first class condition and keeping saw blades properly tensioned, a good operator can square cut stock close enough to size to suit a wide variety of jobs, or it can be cut leaving sufficient stock for grinding. Whether the material is cut with abrasive wheels or saws, one cut squares will frequently eliminate two milling operations or lathe facing operations, reducing processing costs and material waste.

By using cold drawn shapes of machine steel and ground shapes of tool steel, milling and turning operations can often be eliminated entirely by careful cutting to size. For speed and finish on bars less than $1\frac{1}{2}$ in. in cross-section, the abrasive cutoff wheel can be used to advantage. By using the correct wheels, high speed steels or alloy steels are neither burned nor face hardened.

Simple parts required from sheet stock can be laid off and cut to shape by the storemen on the band saw, saving extra operations and transportation. Standard lengths of dowel pins and screws are often issued to the toolmaker from the store when drawings specify special lengths. The toolmaker's time in cutting these items to length can be saved if ordering instructions call for the storeman to deliver them to correct length. This can be done by cutting them with an abrasive wheel and rounding them off

By obtaining the cooperation of the design department on spring sizes, a stock of standard commercial springs can be maintained and the high cost of making odd sizes can be reduced.

Parts made from boiler plate or machine steel that are too heavy to be handled on the band saw can be cut to size and shape by cutting torches with a pantograph attachment. If well set up, parts can be cut to within 1/32 in. of the desired size. For many parts such as filler plates and punch press bolster plates, this tolerance is sufficient. The part shown in Fig. 1 was torch cut at a speed of 12 ipm.

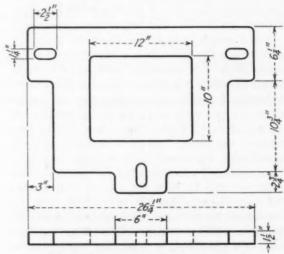


FIG. 1—Torch cutting of filler plates and punch press bolster plates is often accurate enough to eliminate machining. This part was torch cut at 12 ipm.

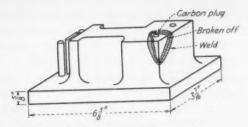


FIG. 2—Broken tools and dies can be salvaged often by welding.

When a pattern for a single casting is required, generally it is considerably cheaper to torch cut the sections and weld them together. The drawing can often be used as a template by sticking it to the pantograph table with grease. Such a setup requires very little time.

Many broken tools and dies can be salvaged by welding, as shown in Figs. 2 and 3. This can be done without softening the parts if proper techniques are used and suppliers of welding electrodes are consulted. Such repair work, however, does require an experienced welder. Parts can be subsequently finished to size by grinding, and in most cases will stand up as well as new parts.

The shedder, shown in Fig. 4, required the replacement of a base that broke off. This was done by brazing on a new base with silver solder, placing the face of the part in a shallow pan of water while the back was brazed.

In turning operations where small parts of tools and machines are made, the full power of the lathe is seldom used. Some of this unused power can be put to use, reducing the cutting time, if the machines are equipped with tungsten carbide tools in recommended tool holders, and the machines speeded up. Tungsten carbide inserts in lathe centers, brazed in place, will save their cost many times by eliminating the frequent grinding of the centers.

On lathes using old style collet chucks operated by a handwheel at the rear of the machine, a cost reduction can be made if these chucks are replaced with latest styles that operate from the nose of the machine.

Lathe downtime can be reduced and more and better work done if standard tools, shapes and grinds are adopted. Instead of operators grinding tools freehand to personally preferred

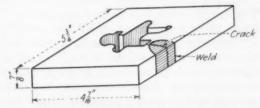


FIG. 3—Weld repaired parts in most cases stand up as well as new parts. This part was repaired without any softening of the material.

shapes on a post grinder, thoroughly tested standard shaped tools, ground in fixtures, can be produced economically and improve machine performance.

Tungsten carbide butt mills are proving their worth on milling machines by removing steel at greatly increased rates. Tungsten carbide boring tools have proved their worth so well on jig borers that most tool shops consider them standard equipment. Duplicate magnetic chucks, used on jig borer tables, reduce setup

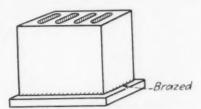


FIG. 4—The base plate of this shedder was silver brazed, with the face of the part resting in water during brazing.

time considerably by permitting an operator to load one part while another is being machined.

By using a binocular microscope on a metal bandsaw machine, as shown in Fig. 5, dies and many other tool and machine parts can be cut to within 0.002 in. of finished size. To get this result, a man with good eyesight and a steady hand must specialize in the use of this machine. Filing parts to size can be greatly reduced because 0.002 in. is largely taken up by the peaks and valleys caused by the roughness of the saw cut. The laying off is done on the jig borers, the width of the scratch line does not influence the accuracy because the operator works to the center of the valley of the line, which is easily seen in the microscope.

Form cutting tools and formed die details can be produced quicker and more accurately



FIG. 5—A binocular microscope makes it possible to tool to within 0.002 in. of finished size.

on properly equipped grinders than on lathes or milling machines. Such equipment consists of optical form grinder, and machine attachments such as angle and radius dressing fixtures, pantograph diamond truing devices working from a template; and wheel crushing fixContinued

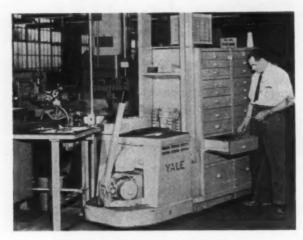


FIG. 6—A traveling tool crib often saves toolmaker's time and expense by bringing parts, materials and drawings to work sta-

tures, form cutting tools and formed die details can be produced more quickly and more accurately on grinders than on lathes or milling machines. In many cases, blanks only are required.

Form milling cutters with not more than $\frac{3}{8}$ in. width of form are being form ground and backed off on a thread grinder from a gashed hardened blank at a third the cost and greater accuracy of turning and backing off on lathes.

A small centerless grinder can be kept busy grinding many tool and machine details in a fraction of the time required on the universal grinder. Many of these parts, perforators, pilots and molding die pins can be ground from hardened drill rod blanks requiring no lathe work.

On the jig grinder, holes can be finished quickly by using tungsten carbide burrs, especially in small holes because of the greater rigidity of the tungsten carbide shanks.

After dies have been hardened, dowel holes can be brought readily to size by using tungsten carbide reamers, saving slow lapping operations. Tapered tungsten carbide burrs used in a rotary filing machine save time in correcting the taper clearance in dies after hardening. Normally, this is done by hand oil stoning.

Punches and strippers can be laid off to size quickly by liquid honing or a fine sand blast. The part is first blued at the furnace, the die is clamped to the part, and the spray directed through the opening. The spray nozzle should be \(^1\)4 in. or smaller for best results.

Toolmaking time can be saved if the shop is large by having a traveling tool crib to deliver and receive tools and gages that toolmakers do not normally keep at their benches, as shown in Fig. 6. This can be used for portering parts in process to various machines and delivering materials and drawings. A light placed at points to suit the shop layout, can be used as a signal when the crib man is needed. Behind the truck, not shown in the photo, is a shelf for portering. Best results are obtained when the truck makes the rounds at regular intervals.

The pattern for these cost reducing ideas is first to eliminate operations by buying as many parts as possible that are not profitable to make in small quantities, and by using materials that require a minimum of machining. Greater care in cutting materials; more extensive use of carbide tools; elimination of milling, turning and bench work; and roughing and finishing more work on grinders saves operations and transportation.

Brazing Preforms Can Be Produced by Coining

SILVER-ALLOY brazing preforms are being produced by a new coining method that eliminates costly dies and excessive scrap. The new technique, developed by the Lucas-Milhaupt Engineering Co., Cudahy, Wis., subjects silver wire rings of circular cross section to pressures up to 180,000 psi between smooth polished dies.

Since the dies necessary for this forming operation are simple and easy to construct, and since there is no scrap generated in the forming process, cost reductions of 30 to 50 pct have been realized over conventional stamping methods.

These silver washers, used for fusing, bonding, brazing, and soldering, can be produced in a

variety of shapes and sizes, according to individual contract specifications.

Because flat rings fuse into metals more readily, forming a more perfect bond and seal, they are replacing round wire rings formerly used in joining fittings for drain plugs on crankcase pans, differential housings, and fluid drive seals. They are also widely adaptable for bonding and joining applications in the refrigeration, heating, air conditioning, food processing, and other equipment manufacturing industries where extra strong joints or air tight brazed seals are essential. Other claimed advantages are easier handling.

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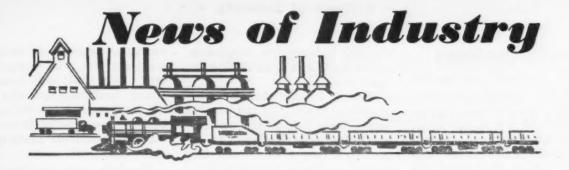
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Cool Winds to Blow

Pittsburgh — The 40-story skyscraper to contain the offices of U. S. Steel Corp. subsidiaries and the Mellon National Bank will of course be air-conditioned. Contract for the job went to the Dravo Corp., of this city. It includes complete air-conditioning, heating, and ventilating. Dravo said that it is the largest air-conditioning job the company has had in its 18 yr history.

Orders Push Primary Aluminum Production to Capacity for 1950

New York—Following the upward trend since last November, production of primary aluminum will be at capacity during the first half of 1950, it is indicated by the current placing of orders. Production spurted ahead by 25 pct in January 1950, 104,045,600 lb, over December '49, 82,332,329 lb, reported Donald M. White, secretary of The Aluminum Association.

Shipments of aluminum sheet, strip, and plate also moved up in January to 69,349,363 lb from December's 62,524,984. New facilities will increase future production potential, Mr. White said. The idle potline at the Jones Mills, Ark., reduction plant of the Reynolds Metals Co., has been reactivated. Partial production at its new reduction works, Port Lavaca, Tex., has been opened by the Aluminum Company of America.

ALUMINUM—Huge Ingot Expansion Planned

Aluminum Co. of Canada plans British Columbia ingot plant and power site . . . Aluminum Co. of America may build arm in Alaska . . . Water power biggest aid—By JOHN ANTHONY

New York—Plans are afoot for a tremendous expansion of primary aluminum capacity in North America, using the untapped waterways of Canada's British Columbia for low cost power and tidewater sites on the Pacific for low cost water transportation. The United Kingdom is still the principal consumer of Canadian aluminum, but U. S. industry can look forward to expanded supplies from the north in the next 5 to 10 years when market conditions warrant it.

Low cost water power is the key to low priced aluminum production. Continued expansion of the domestic aluminum market is heavily dependent on the industry's ability to hold down production costs despite advancing labor rates and other charges. The virgin waterways of British Columbia offer the outstanding promise of low cost water power in North America.

Low Cost Power Needed

The latest great water power development in the United States was the Bonneville development just before the war. It gave birth to the gigantic Northwest aluminum industry. Now there are no major water power developments on the horizon where aluminum reduction capacity accessible to

water transportation could be built. And the growing demand for power by industry is gradually siphoning off some of the power heretofore available to domestic aluminum facilities.

Aluminum Co. of Canada is now working out plans for a huge new ingot plant and power development in British Columbia, after several years investigation of possible power sites. The project

Turn to Page 110

February RFC Loans to Steel Products Firms Top \$10 Million

Washington — In the ranks of the largest Reconstruction Finance Corp. borrowers during February were Northrup Aircraft, Inc., Hawthorne, Calif., for \$5,-800,000, and the Graham-Hoeme Plow Co., Amarillo, Tex., \$2,-400,000.

Northrup's loan will be repaid in about a 5-yr period. The funds will be used for working capital and debt payment by both firms.

Other February RFC loans were: \$1 million to the Highway Trailer Co., Edgerton, Wis.; \$1 million to the Jessop Steel Co., Washington, Pa.; \$500,000 to the Delta Tank Manufacturing Co., Inc., Baton Rouge, La., and \$725,000 to the Martin Brothers Co., Toledo, Ohio.

Aluminum Expansion Planned

Continued from Page 109

would require opening up a virgin wilderness, with all the expense and hazards of such an operation. Selection has narrowed down to the Nechako-Nanika River systems in British Columbia's Tweedmuir Park section. Preliminary investigation cost \$100,000 and an additional \$900,000 is being spent for further studies.

Vast Reservoir Planned

The dam would be constructed near Burns Lake on the Nechako, to form an immense reservoir from the three lakes in the area. The water would be diverted from its natural course into the Fraser River by a 10-mile tunnel through the mountains to a tidewater power plant developing 1.5 million hp.

An ingot reduction plant would be located about 150 miles west of the dam at Kitimat on tidewater at the head of Douglas Channel. With an estimated annual ingot capacity of at least 300,000 metric tons, this would be close to the biggest aluminum reduction plant in the world.

Alcoa Has Similar Plan

Spokesmen for the company have cautioned that there has been no final decision to proceed with the project. But British Columbia officials are ready to issue a waterway rights license for the project regardless of the opposition of fisheries interests. This would not include rights on the Chilco system to the South, one of the province's principal sockeye salmon areas. The company has not yet accepted the license for the water rights.

In the same general area, the Aluminum Co. of America has acquired property at Skagway, Alaska, on tidewater, and at nearby Dyea, on which new reduction capacity may eventually be built. Production in Alaska would not be subject to the U. S. import duty on aluminum. Such a plant, when built, would also be of large capacity to take advantage of the wealth of low cost power from an

Alaskan hydroelectric installation operating from a British Columbia watershed.

Bauxite ore for the aluminum industries of the U. S. and Canada comes largely from the Guianas on the North Coast of South America. To supply a West Coast Canadian aluminum industry with ores from this source would involve heavy expense in Panama Canal tolls. Raw bauxite at the mines is worth roughly \$5 to \$10 a ton. An additional \$1 a ton for Canal toll would be a major cost increase.

It is more than probable that the Bauxite supply for a western Canada industry would come from Indonesia. At the high rates of production at which the proposed plants are expected to operate, there might well be a complete change in the relative standing of the continent's foreign bauxite resources.

U. S. a Big Customer

The U. S. has been drawing heavily on Canadian aluminum during the postwar period. The shortages here during 1948 and in part of 1949, coupled with the lower tariff rates established by the Geneva Agreement have stepped up this trade beyond any prewar period. Much of the imported metal comes in as ingot. Canada's aluminum industry is very short of capacity for finished



Sometimes I wish Julius hadn't been promoted to that pipe-threading machine.

products, compared to its heavy ingot capacity. The U. S., on the other hand, has built more finishing facilities, particularly in the wartime and postwar period, than can be supplied from existing ingot facilities operating at reasonable power costs.

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The high point for imports of Canadian aluminum was 1948, due largely to the domestic shortages of that year. Imports of primary ingot rose to 154.8 million lb from 30.6 million lb in 1947. In 1949, despite the curtailed market here, imports were 142.3 million lb, almost as high as the previous year. It is conceivable that the U. S. might eventually replace the United Kingdom as the biggest consumer of Canadian aluminum.

Resume Your Reading on Page 109

Budd Co. Signs Pension Plan

Philadelphia — A pension plan agreement in line with others in the automotive industry was signed last week by The Budd Co. and local 813, United Auto Workers, CIO. It was the result of 11 months of negotiation. With costs of the insurance plan signed last December, payments of the company will amount to 10¢ per hour.

Gas, Dust Dangers Investigated

Washington—Gas and dust hazards in manufacturing plants is the subject of a Congressional investigation. Authority to begin the investigation was given the Bureau of Mines by bills sponsored by Representatives O'Brien and O'Hara, D., Ill., to protect health and prevent explosion.

GE to Build Marine Turbine

Schenectady, N. Y.—Geared turbine marine propulsion equipment to power the U. S. Maritime Commission's C3-S-DX1, a new type of cargo vessel, will be built by the General Electric Co.

The single screw vessel to be built by the Ingalls Shipbuilding Co. yard at Pascagoula, Miss., is designed for world trade. It will be driven by a 12,500 hp marine geared-turbine. This equipment will consist of a high pressure turbine and a low pressure turbine, cross compounded to form an integrated unit. Articulated reduction gears will complete the power plant.

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The design will allow high steam conditions to be utilized for both ahead and astern operation. Special alloy steel will be used as required for the pressures and temperatures encountered.

Ford Plans Office Construction

Detroit — A multimillion dollar group of office buildings will be built by the Ford Motor Co. in Dearborn, Mich.

The administrative center will consist of an 11-story office building will house Ford's central staff offices. An adjacent 6-story building is tentatively planned. Enclosed parking facilities, service facilities, cafeteria and dining room will be located in a 3-story building also scheduled.

Gurney Ltd. Buys Toronto Plant

Toronto—Gurney Dominion Furnaces Ltd., a wholly owned subsidiary of Standard Sanitary & Dominion Radiator Ltd., has purchased the Toronto plant and property of Gurney Foundry Co., and will take possession on Apr. 1.

RIT Continues Tool Program

Rochester, N. Y.—Evaluation of cutting tools will be featured in the second 1950 Machine Tool Familiarization Training program scheduled for April 26 to May 5 at the Rochester Institute of Technology, according to E. W. Goebel, head of the machine screw lab.

Makes Profit Despite Shutdown

Chicago — Despite a complete shutdown of carbuilding facilities for several months of the year, operations of the Pressed Steel Car Co., Inc., in 1949 resulted in a net profit of \$1,689,390. This profit compares with a net loss of \$2,270,841 in 1948 which was a year of near capacity production.

O'Mahoney Urges New Steel Industry Probe

Senate-House Economic Committee brands steel price rise in December as "untimely and unwarranted" . . . Committee minority charges "unreasonable bias" . . . Sen. O'Mahoney Stars.

Washington — A new congressional investigation, designed to "restore competitive conditions," faced the steel industry this week. The Senate-House Economic Committee, reporting on price rises put into effect by steel producers last December, branded the increases as "untimely and unwarranted," and called for further public study of the industry with respect to pricing policies, size, integration, and financial management.

Wants Subpoena Power

The proposed investigation was urged by the eight Democratic members of the committee. The six Republican members denounced the majority's findings as "failing to analyze the basic problems," and charged the report was not an "impartial appraisal," but was "a bill of complaint," with a

faulty economic brief to support the complaint.

Senator O'Mahoney, D., Wyo., committee chairman, said this week he hoped Congress would vote him subpoena power for his proposed investigation, but indicated that he would proceed with the committee probe with or without power to subpoena books and records of steel companies.

The committee majority, declaring that "more facts are needed now," made these four specific recommendations:

(1) Information of the type sought, but not obtained by this committee, namely data on prices, output, costs, and profits of each of the major steel producers, should be systematically collected by the Federal Trade Commission, and kept currently available for use by Congress.

(2) In the interests of preserving competitive free enterprise and protecting the public from arbitrary increases in prices, this committee recommends that steel producers file with an appropriate agency of the Federal government their schedules of proposed price increases, that hearings be held speedily to get the facts on the reasons for, and general economic effects of, such increases, and that such industry-wide price increases be deferred for a definite period of, for example, 30 days after such announcement. Isolated, independent price increases on individual products made by individual concerns, are not affected.

(3) Along with these recommendations, we further recommend that this committee consider a study of the means whereby a greater degree of competition within the steel industry

may be achieved.

(4) With the express purpose of revealing the effect on free, competitive enterprise of present trends in the steel industry, a study should be authorized to examine the extent to which the steel industry has developed technological and economic similarity to public utilities and has acquired such strategic importance in war, peace, and in the maintenance of high-level employment as to become uniquely affected with a public interest in order that the Congress may determine what, if any, legislation should be adopted for the preservation of competition.

Charge "Unreasonable Bias"

Republican members of the committee accused the majority members of "unreasonable bias," and declared that the fundamental question for Congress to decide was whether steel prices are higher than they should be because of conditions in the industry, and

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Time to Rebel

Washington — Representative Macy, R., N. Y., this week called for an end to political investigations of the steel industry, and asked Congress to set up a bipartisan commission to conduct a continuing study of the industry.

Mr. Macy said he was "deeply disturbed" by the majority recommendations of the Senate-House Economic Committee. "They sound like a blue print for Socialism, and are suspiciously close to the arguments advanced by the British Labor-Socialist party in England," he declared.

"It is apparent from a study of this report that unless the American people assert themselves immediately, the days of reward for personal initiative and private enterprise will be lost beyond recall. Fortunately, there is still time to rebel against being made to walk the plank into the stagnant, enervating waters of Socialism," he told the House.

INDUSTRIAL SHORTS

CLOSING 3 UNITS—Lack of demand for coal due to inroads by other fuels has forced HANNA COAL CO., St. Clairsville, Ohio, to discontinue operations of one unit in each of its three mines. This will result in a production loss of approximately 60,000 tons of coal a month.

NEW POWER PLANT — The construction of the first section of the Meramec Power Plant of Union Electric Co. of Missouri has been awarded to UNITED ENGINEERS & CONSTRUCTORS INC., Philadelphia. The initial installation is to consist of one 110,000 kw high-pressure high-temperature turbogenerator and one boiler, together with all accessories.

MERGER—The Standard Machinery Co., Auburn, R. I., and Southern Electronics, North Carolina, have merged to form the STANDARD ELECTRONIC CORP. in Auburn. They will make radio and television equipment. The southern firm is closing two plants and moving its machinery to Auburn.

CHANGES HANDS — New Britain Bearing Co., Inc., New Britain, Conn., has been purchased by the MORTON BEARING CO., Ann Arbor, Mich. Hudson T. Morton is president of the new company and Carl Marholin will continue in charge of the shop.

CENTRALIZING — FARREL-BIRMINGHAM CO., INC., will move to its main offices at Ansonia, Conn., the gear sales division of Buffalo and the marine sales division of New York.

SALES AGENT—E. W. Bliss Co., Toledo, has appointed STEEL CITY TOOL & MACHINERY CO., INC., Pittsburgh, as sales representative for their mechanical and hydraulic presses in portions of western Pennsylvania and southeastern Ohio. At the same time Bliss is closing its Pittsburgh sales office.

MOVING — All manufacturing and administrative activities of the Marvel-Schebler Carburetor Div. of BORG-WARNER CORP., Flint, will be transferred to Decatur, Ill., in the late summer or early fall. Negotiations are in progress for the sale of the Flint plant to E. I. du Pont de Nemours & Co.

SAFETY FIRST — A safety award has been given to SOSS MFG. CO., Detroit, hinge manufacturers, by Liberty Mutual Insurance Co., Boston, for its outstanding record in accident prevention. It had operated for a period of nearly 5 months without a single lost time accident.

EASTERN OUTLET — A New York office at 220 E. 42nd St. has been opened by the CONTINENTAL GIN CO., Birmingham, manufacturers of cotton ginning, materials handling, power transmission and special machinery, to handle domestic and export activities of their Industrial Div. in the East. A. Walter Gotta is district manager.

FORMS CORPORATION—The RICE PUMP & MACHINE CO., Milwaukee, formerly a division of Milwaukee Chaplet & Mfg. Co., has been established as a separate corporation. R. D. Houghton, formerly division manager, has been elected president and treasurer.

EXPANDING—A second plant in Montreal has been purchased by the VAPOR CAR HEAT-ING CO. OF CANADA, LTD., which is affiliated with Vapor Heating Corp., Chicago. This plant will be used to manufacture Vapor steam generators for Canadian railroads.

TOOL DISTRIBUTOR—Carboloy Co. Inc., Detroit, has appointed ERIE MFG. & SUP-PLY CORP., Erie, Pa., as an authorized distributor for Erie and northwestern Pennsylvania.

Urges New Steel Probe

Continued from Page 111

if so, whether legislative action should be taken to remedy the situation.

The job Congress has to decide is whether the price of steel today is so high that it suggests a lack of competition and price control by the companies, the minority stated.

"We have studied the record, and do not find any direct evidence of lack of competition," they declared.

Price Control Aim Seen

Republican members noted that the recommendations of the majority look strongly in the direction of governmental price control. In this respect, they said, the recommendations are in accord with the controlled-economy policies of the Truman Administration as set forth in the Spence Bill (H. R. 2756).

In answering the majority's suggestion that the steel industry be regulated as a public utility, the Republican members said that "if prices are too high because competition has not worked effectively, then our first effort should be to restore competition.

Result Less Progressive

The only justification for steps looking toward price control would be the complete surrender of the possibility of maintaining a free competitive system in any industry, they reasoned, adding that if competition doesn't work and some monopolist is going to fix the price, then the public will demand that the government do the fixing, but the result is generally much less progressive than would be achieved in a competitive system.

Canada Ends Steel Controls

Ottawa—The Government's control over steel in Canada, which has ranged for almost a decade except for a brief period in 1945, ends on Mar. 31, according to C. D. Howe, Trade Minister.

Kaiser-Frazer Makes Turnabout Fair Play

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Utilizing a new "pin wheel" mounting arrangement developed jointly by Kaiser-Frazer and Union Pacific R.R. engineers, K-F is shipping 16 auto bodies on a flat car to its West Coast assembly plant at Long Beach, Cal., thereby cutting shipping charges in half.

In addition to a 50 pct slash in freight costs, loading and unloading time has been cut to two hours as compared with nearly a full day formerly required to load 8 bodies into a box car. Cranes are being used at Willow Run but such equipment is unnecessary for loading or unloading, according to K-F engineers.

Test runs have shown the new method to be highly satisfactory. Bodies have not been damaged en route or by "humping" any more than normally.

The top row of bodies is lowered into position on a specially designed cradle mounted transversely on the flat car. The bodies are then turned 180° and a second group of 8 bodies is lowered into position. The third step is to turn each pair of bodies 90° so that the bodies stand on end. Each body is held firmly in place by special clamps and fixtures.

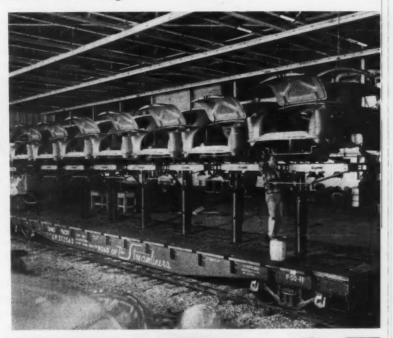
TURNING MOMENTS: Photographs at right show K-F bodies being loaded on a flat car. In top photo, bodies are lowered into position on transversely mounted cradle. Bodies are rotated 180°, in middle photo, to make room for another row to be placed on top of them. Bottom picture shows pairs of bodies being turned on end ready for shipping.

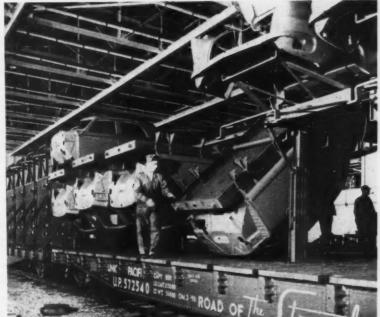
The new loading plan is expected to reduce the present cost differential in favor of Ford and General Motors who ship parts knock-down for assembly at distant plants. The new development is also expected to advance K-F's present plan of locating a number of small assembly plants throughout the country. Under the K-F plan, these small assembly plants will receive bodies-in-white and assemble and paint the cars at that point instead of shipping finished cars from Willow Run.

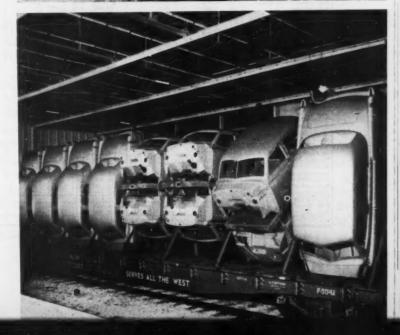
The present Frazer models weigh 1184 lb, bringing total weight under the 12,000 lb carload maximum rate. Total shipping cost per loaded car is the same as for 8 cars in a box car.

The bodies are bonderized before shipping and this affords adequate protection against the weather.

It is reported that Studebaker engineers are considering the adoption of a similar loading arrangement for shipping to its West Coast assembly plant.







SFSA Awards Annual Medals To Casting Industry Executives

Chicago-National medal awards for outstanding leadership in the steel casting industry were announced recently by F. Kermit Donaldson, executive vice presi-





A. J. McDonald

J. F. Lacey

dent of the Steel Founders' Society of America at the association's annual meeting.

Honored with the presentation of the society's top award, the Lorenz Memorial Gold Medal, was A. J. McDonald, vice president of American Steel Foundries. In presenting the award for 1949 Thomas H. Shartle, president of the SFSA, stated that Mr. Mc-Donald has brought the industry

to a full realization of its responsibilities in providing a better product, and has awakened the industry to the necessity of concerted action in product improvement.

The SFSA's Technical and Operating Gold Medal was awarded to John F. Lacey, works manager. Commercial Steel Casting Co., Marion, Ohio, for coordinating research and product development activities of the SFSA.

At the same meeting Mr. Shartle was re-elected president of the society; J. E. Mullen, vice president, National Erie Corp., Erie, Pa., was elected vice president; and G. Rhodes Casey, president, Treadwell Engineering Co., Treadwell, Pa., was elected national director.

Foundry Men Get Safety Oscar

Trafford, Pa.-Compiling a record of more than 2 million manhours of labor without a single lost-time accident, the 850 employees of Westinghouse Electric Corp.'s Trafford foundry were awarded the company's "Safety Oscar," a golden statuette, in ceremonies held recently.

January Finished Steel Shipments

As Reported to the American Iron & Steel Institute

			Jan	HATY				20	to Date This Year		
STEEL PRODUCTS	1	Curbus	Alley	Dissinitus	Total	200	Carless	Mine	Desiglates	Total	1
Blooms, slabs, bijlets, tube rounds.	1A	30,107	8,560	815	39,539	0.7					
sheet bern, etc	138	154,679	33,075	875	186,629	3.4				1	
Skelp		13,326	337-13		13,326	0.2				1	
Wire rods	3	71,246	1,126	67	72,441	1.3					
Structural shapes (heavy)		321,619	3,708		325, 327	5.9					
Steel piling		17,595			17,595	0.3		1	1		
Plates	6	444,269	11,031	740	456,040	8.3					-
Rails-Standard (over 60 lbs.)	7	141,745	- ~		9,086	2.6					
Rails-All other		9,060	26		7,984	0.2		1		1	
Joint bars		7,924 25,905			25,905	0.5					
Tie plates		7,943	- 1	- 1	7,943	0.1			1		
Wheels (redled & forged)	1 11	16,572	8		16,580	0.3		1			
Axles		4,490	56	- 1	4,546	0.1				1.	
Rary Hat railed (incl. light	100	1,100			-12					1	1
shapes)	34	463,580	154,314	1,950	619,844	11.3				1	
Bara		181,732			121,732	2.2		1	1	1	
Bare-Cold Snished		91,526	18,237	1,797	111,520	2.0		1	1	1	
Bare-Tool Steel		1,133	4,710		5,843	0.1					
Standard pine	110	806,597	- •	3	206,600	3.8					
Oil secutry goods	19	114,918	16,827		131,739	2.4		1	1	1	
Line nine	. 30				265,709	4.6			1	1	
Mochenical tubing	83	34,738	12,514	260	47,512	0.9			1	1	
Presente taking	. 23	16,238	2,726	541	19,507	0.4					
Wise-Drawn			2,515	1,327	229,918	4.2					
Wire-Nails & staples		71,271		5	71,276	1.3				1	
Wire-Barked & twisted		15,879	-		15,879	0.3				1	
Wire-Woven wire fence					32,193	0.6					
Wire-Bale ties			•	•	2,427	-			-	-	-
Black plate	- 3				36,849	0.7					
Tin & torne plate—bet dipped					142,788	3.8					
Tin plate-Electrolytic	15			*				-	-	-	-
Shorts—Elet relied	1 22	564,925	18,144	2,176	585,245 711,813	10.7				1	
Shoots—Cold Police	33		7,129	1,100	196,014	3.6					
Shorts—All other coated	1 34		2,029		15,148	0.3			1	1	1
Shorte-Enqueling			-		16,134	0.3					1
Electrical shoots & strip	. 86	6,618	40,957		47,575	0.9					
Strin-flet railed	. 1 87	179,091	4,053	314	176,458	3.2					
Strip_Cold rolled	34	196 183	1.036	13.543	140,762	2.6					
TOTAL	1	5 107 mg	342,785		5,482,691	-				T	
	1	17,201,100	2-5, (0)1	36,190	7,408,091	1,00.01		1	-	1	

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Westinghouse to Construct Nile River Generating Station

Pittsburgh - In 1952 on the banks of the Nile River, Egypt, a 45.000 kw steam electric generating station built by the Westinghouse Electric International Co. will aid drainage and irrigation of rich fields. Receipt of the \$5 .-337,000 order from the Egyptian Ministry of Public Works was made public by William E. Knox, president of the American com-

Construction of the new power station at Talkha, 90 miles north of Cairo, will begin early in 1951. The largest of Delta region pumping plants, the Westinghouse project will replace small diesel power plants.

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Westinghouse equipment to be used includes: three 15,000 kw turbine generators, steam generators, power transformers, piping pumps, switchgear, and substation apparatus. The boilers will burn Egyptian fuel oil, with provision made for burning pulverized coal later. Construction work will be handled locally.

Auto Steel Shipments Rise

New York-The automotive industry received more steel shipments in January than in any previous month, the American Iron and Steel Institute announced recently. Total shipments of steel products were at the highest level since last April.

Automobile, truck and parts manufacturers received nearly 1,-168,000 net tons of steel in January. That was 21.7 pct of the total estimated shipments of almost 5,482,700 tons. In all of last year the automotive classification received an average of 18.8 pct of shipments compared with 15.5 pct in 1948.

GM Cited by Safety Council

Detroit - For the sixth time General Motors Corp. has been given an award by the National Safety Council for distinguished service and safety.

Speakers and Planners of Philadelphia ASTE Convention Forum



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Dr. E. G. Nourse



Dr. C. C. Balderston



E. T. Cheyfitz



J. A. Livingston



R. B. Douglas



J. S. Hildreth

Philadelphia—Four of the nation's best-known economists will address the Economic Forum of the American Society of Tool Engineers here on Apr. 10. The forum is being arranged and sponsored by a committee of publishers as a feature of the society's annual convention, Apr. 10-14.

The economists will speak at the Philadelphia Academy of Music on Apr. 10, starting at 8:15 p.m. They are: Dr. E. G. Nourse, formerly chairman of the Council of Economic Advisers to the President and a founder of Brookings Institution; Dr. C. C. Balderston, dean of the Wharton School of Finance and Commerce and former chief of the War Dept. Wage Administration Agency; E. T. Cheyfitz, labor economist, member of the CIO's National Executive Board, and former economic advisor on labor to the War Production Board; and J. A. Livingston, former economic assistant to the Chief of the Office of War Mobilization and Reconversion.

Robert B. Douglas, ASTE presi-

dent and head of Godscroft Industries, will open the meeting. Walter D. Fuller, chairman of the Curtis Publishing Co. and vice chairman of the Committee for Economic Development, will make the main address.

Joseph S. Hildreth, president of the Chilton Co., is chairman of the publishers' committee. Paul Wooton, president of the Society of Business Magazine Editors and secretary of the White House Correspondents' Assn., will introduce the speakers.

New England Council Explores Methods of Financing Industry

Providence — An earnest effort to find the best method for financing small industries and modern plan construction in New England was made here recently at the New England Council's 98th quarterly meeting.

Business leaders from the six New England states discussed a new plan for a Rhode Island industrial building foundation, the unique structure of Maine's development credit corporation and preliminary findings of a committee to study industrial development in New Hampshire.

In a letter addressed to the committee, Royal Little, president, Textron, Inc., urged that New England must find means of meeting the competition of other areas in providing adequate modern fac-

tory buildings for existing and new industries if the region is to hold its own in industrial development.

Detroit Welding Conference Set

New York—Advances in electric welding will be discussed and demonstrated at a 3-day conference from Apr. 5-7 in Detroit's Rackham Memorial Building. Joint sponsors of the second electric welding conference are the American Institute of Electrical Engineers, the American Welding Society, and the Industrial Engineers' Society of Detroit.

The Detroit Section of the AWS will demonstrate welding techniques and equipment on Thursday and Friday, Apr. 6, 7. Final sessions will involve discussions of resistance welding equipment and power supply.

Blaw-Knox President Assails Federal Depreciation Allowance

Pittsburgh — Deploring the depreciation allowance granted by Federal tax laws as insufficient, William P. Witherow, president, said in the Blaw-Knox Co. annual report recently that capital expenditures in the last 4 yrs reached \$7,442,000 as compared with \$3,051,000 allowance for depreciation. The disparity between the two figures was compensated for by earnings, he said.

Earnings for 1949 were \$3,538,-408, or \$2.51 per share. Working capital increased \$1,152,534, and current assets were 3.32 times current liabilities, compared to a ratio of 2.77-to-1 a year earlier. A reduction in inventories, an increase in liquid funds, and a further increase in book value equity per share also were reported.

Allegheny Ludlum Proposes Regional Stockholders Conclaves

Pittsburgh—Allegheny Ludlum Steel Corp. is proposing a series of regional stockholders' meetings for this spring and early summer. A motion picture reviewing the growth of the company from a one-furnace operation in 1854 would be shown.

The company's annual report covering operations in 1949 included a stamped card on which the stockholders were asked to indicate (1) whether they would be interested in attending a regional meeting and (2) where they would like the meeting to be held.

Improvements Paying Off

H. G. Batcheller, chairman, reported that the company is now beginning to reap the benefits of its \$30 million plant improvement program, started in 1946 and all but completed last year; that business is booming to the extent that an excellent first quarter is assured and that high level operations are likely to continue for an extended period; that demand for television alloys is "phenomenal";

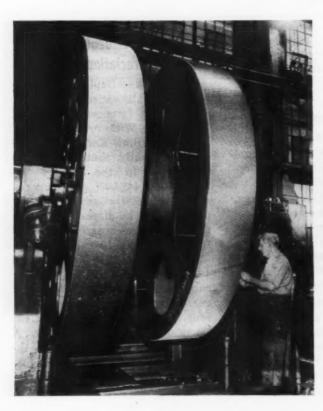
that research in titanium and continuous casting is progressing.

Allegheny Ludlum's subsidiary, Wallingford Steel Co., Wallingford, Conn., expanded capacity by the installation of a new cold strip mill and a new electro-weld tube mill, Mr. Batcheller reported.

Water Works Course Slated On Small Communities' Needs

Madison, Wis.—A four day course on the water works needs of small communities will be held for superintendents and operators of water works plants throughout Wisconsin in the University of Wisconsin from Apr. 10-13.

Ninth of a series, the course is a joint venture of the University and the League of Wisconsin Municipalities and the state's section of the American Water Works Assn. Lecturers will be drawn from the staffs of the University's hydraulic and sanitary engineering laboratory, the state laboratory of hygiene, and the state board of health. Instruction will include laboratory procedures on chemical and bacteriological analyses.



Big Teeth: Worker with micrometer checks teeth of huge marine reduction gear nearing completion at the South Philadelphia Works of the Westinghouse Electric Corp. The I3 ft diam, 53,000 lb gear will be installed in an oil tanker.

Twist Drill Producers Plan 10 pct Price Rise for April 1

Detroit—An increase of 10 pct in the price of twist drills, countersinks, reamers and similar items becomes effective April 1. The recent rise in steel prices plus the cumulative effects of increased costs of labor and taxes makes the increase necessary, insist producers.

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They claim that the price boost is long overdue, pointing out that drill prices have increased only 37.3 pct since 1940 compared with much larger boosts in the price of labor, steel, and other materials.

Twist drill production in the Detroit area has picked up substantially since the first of the year, aided by the high volume of auto production.

Engineers Plan April Meeting

Washington—The spring meeting of the American Society of Mechanical Engineers will be held here from Apr. 12-14 in the Hotel Statler, headquarters. Sponsors are the society's 19 professional divisions and committees and the American Rocket Society.

Sixty-six speakers will present 45 papers on various phases of engineering at the 21 scheduled sessions. On Thursday, Apr. 13, the aviation division will present a symposium on turbo-jet gas turbine anti-icing. Tours of government scientific laboratories will also be held.

Smillie Named ASTE Chief

Detroit — Charles M. Smillie, president of C. M. Smillie Co., has been elected chairman of the Detroit Chapter of the American Society of Tool Engineers for 1950.

Other officers are: John D. Anderson, Packard Motor, first vice-chairman; Andrew M. Grant, Federal Products Corp.; secretary and John W. Wagus, American Twist Drill, treasurer.

The Detroit Chapter now has approximately 10 pct of the 18,000 members of ASTE.

Climax Plans Bigger Molybdenum Ingots

Furnace to make 1000-lb experimental ingots is under way ... Present 200-lb ingots can be rolled and forged ... High temperature possibilities seen.

Detroit - Construction of a vacuum arc-melting furnace for experimental production of molybdenum ingots and certain molybdenum base alloys, as large as 9 in. in diam and weighing 1000 lb, is under way at Climax Molybdenum Co. of Michigan in Detroit.

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Climax research on the melting process began in 1943 when a need for larger sections of the metal than were then produced by powder metallurgy became evident.

Today Climax is producing, on an experimental basis, 200-lb ingots, 6 in. in diam, on which methods of fabrication are being investigated. In cooperation with several industrial plants, the product from these experiments is being used to explore potential application. There is a potential application for large sections of molybdenum and molybedum-base alloys in widely varied fields.

High Temperature Use Seen

Early experiments have revealed that molybdenum and its alloys possess useful hardness and strength in a temperature range above that filled by the present high temperature alloys. Molybdenum possesses high thermal conductivity and greater resistance to thermal checking than the alloys now available. These properties also suggest applications for which the present materials of construction are inadequate.

Investigations at Climax, and those in progress in other research laboratories, have in the last 5 years added substantially to the knowledge of molybdenum. Extensive fundamental research programs coordinated by a government agency are in progress.

Can Be Forged and Rolled

Commercial forging and rolling has been established as feasible and machining and grinding present no impractical situations. However, more experience is needed in all

phases of fabrication of molybdenum and its alloys. The welding of molybdenum is as yet a laboratory operation which yields erratic results

Work Is Still Experimental

Probably the largest single problem standing in the way of early extensive application of molybdenum in many industries is the requirement of protection from oxidation. This problem is being investigated in several quarters and already there have been some encouraging developments.

The Climax Molybdenum Co. of Michigan is a wholly owned research subsidiary of the Climax Molybdenum Co., New York. Carl M. Loeb, Jr., is vice-president in charge of development of the parent company; Alvin J. Herzig is president of the Michigan com-

In announcing the construction of the larger melting equipment, Mr. Herzig emphasized the fact that the company still regards the program as experimental. Molybdenum production from the experimental ingots has been used to date to determine the properties or potential applications for the metal and its alloys.

Lake Superior Iron Ore Consumption Drops in February

Cleveland - United States and Canadian blast furnaces consumed 5,329,000 gross tons of Lake Superior district iron ore in February, as compared with 6,740,047 gross tons in January and 6,992,-425 gross tons in February 1949. according to the monthly report of the Lake Superior Iron Ore Assn.

Cumulative consumption for 1950 totaled 12,069,047 gross tons at the end of February as compared with 14,582,896 gross tons for the corresponding period of 1949, the report showed.

Iron ore stocks on hand at furnaces and Lake Erie docks Mar. 1 totaled 26,745,293 gross tons compared with 32,003,928 tons a month ago and 24.981,208 gross tons on Mar. 1, 1949. Active blast furnaces depending principally on Lake Superior district iron ore totaled 111 in the U.S. and seven in Canada. Idle furnaces totaled 72 in the U.S. and three in Canada

HEXAGONAL KELLY: A "Kelly", the metal link which transmits driving power of oil rig's engines to the drill pipe string, receives characteristic hexagonal surface by milling process in the National Supply Co.'s Torrance, Calif., plant.



The ECONOMIC SIDE.

By JOSEPH STAGG LAWRENCE

Why?

THE House Committee on Foreign Affairs has just voted to cut \$1 billion from the proposed \$3.1 billion which the Administration has asked to carry the Marshall Plan through June 1951. The committee wants to substitute wheat, cotton, peanuts, potatoes, dried eggs and prunes, now held by the Commodity Credit Corp., for the billion dollar cut.

This would save money for the taxpayer; it would provide an outlet for excess farm products; it would be direct relief, like taking a panhandler into a restaurant for a cup of coffee instead of giving him a dime. At least that is the way the congressmen voting for the cut are reasoning.

All this suggests that it is high time we re-examined the premises on which foreign aid rests. Why precisely is the American taxpayer being asked to send billions abroad at a time when our own government is unable to balance its budget?

During the last 35 years, according to an ECA study, the country has sent abroad 101 billion of American goods in excess of our receipts. If we credit against this the gold we have received and the capital repatriated, it still leaves an amount equal roughly to 3 pct of total American income for the period. The greater part of this aid has been extended during the last 10 years. Since the end of the war, we have dug into our pockets to the extent of 30 billions. This "ain't hay."

What are we doing it for?

Immediately after Mr. Marshall made his famous speech at Harvard in June 1947, the indicated beneficiaries met at Paris to determine the amount they "needed" and the

allocation. They based their calculations of "needed" aid on the increase of American output during the war years. This measured the growth in American economic potential attributable to the war. They felt they were entitled to a similar boost.

The 16 nation Paris report in 1947, in explaining the targets which it set up for aid, said: "The production expansion which is envisaged by 1951 is similar in general scale to that achieved by the United States in the mobilization years 1940 to 1944." The slide-rule boys said this meant that the United States must underwrite an 88 pct increase in the economies of western Europe. Is this the commitment which the American taxpayer made?

The realists on this side of the Atlantic saw in the Marshall Plan an entirely different purpose. It was an attempt to erect road blocks against a possible westward sweep of Communism. If this is the purpose, how succesful has been the aid already granted? Have we gained new allies during the last 2 years? Have our natural allies become stronger and more reliable as a result of billions in American aid?

Some cynics on the side lines asserted that the Marshall Plan was merely a device for dumping American goods, that the maintenance of a high level of economic activity in the United States was an absolute political must; that this level could not be maintained without a prodigious program of dumping.

Or are we doing all this out of a selfless desire to raise the living standards of Hottentots and promote the material well being of undeveloped areas?

This may be the time to sit down and take stock.

Chemical Grade Manganese Added to Munitions Board List

Washington — The Munitions Board has added chemical-grade manganese to the list of commodities being stockpiled for national defense.

The board also revised its stockpiling objectives for chemicalgrade chromite, tin, coconut oil, palm oil, castor oil, and clestite. It declined to state whether the goals were raised or lowered.

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The new addition to the list, chemical-grade manganese, is used primarily to produce hydroquinone, used in the production of synthetic rubber and in photographic chemicals. Production of nicotinic acid, potassium permanganate, plastic stabilizers and due intermediates, also requires the use of this ore.

Reynolds Metals Seeks Rise In Import Duties on Aluminum

Washington — Charging that present tariff rates are so low as to be destructive to the American aluminum industry, Reynolds Metals Co. last week asked the U. S. Tariff Commission to sharply increase import duties on the metal and its products.

Revised at Geneva in 1947, present import duties are 2¢ per lb on primary aluminum and 3¢ per lb on semi-fabricated products.

Reynolds has asked that these be increased to $4\frac{1}{2}\phi$ and 7ϕ , respectively. Reynolds also urged that a system of import controls "geared flexibly" to domestic needs should be established after a full-scale study of the industry's capacity and domestic requirements.

Pittsburgh Business Rises

Pittsburgh — Ridding itself of coal strike effects, the Pittsburgh district's business index for the week ending Mar. 17 showed a rise to 186.6 pct of the 1935-39 average. It was at the highest point since last May. The Bureau of Business Research, University of Pittsburgh, also noted that the index in early March had slipped to 121.4 because of the coal strike.

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THE IRON AGE

Lukens Steel—the Heart And Lifeblood of a Town

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Coatesville's bread and butter
... Labor and company respect
each other—By TED METAXAS

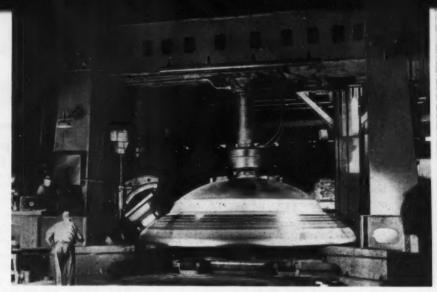
Coatesville, Pa. — With the shadow of depression dark over the land in the 1920s and to the sour tune of factory gates clanging shut to sever millions from their incomes, mass layoff was a scythe that harvested entire communities. Coatesville was also a victim, but a grudging one. Lukens Steel Co., the town's economic mainstay, had a heart and the proper measures that typify the spirit of friendship and confidence existing between company and employees.

Planning for the welfare of both company and worker in the Lukens tradition, the firm retained the great bulk of its labor force on the payroll. The burden of suffering was not shifted on some as by the mass layoff procedure. Sparse working time was spread out and men went on 2 and 3-day weeks. But most of them worked and had something.

Partners In Enterprise

Out of the pockets of a high company official came funds for a works project that was profitless. To others who could not be employed thus went company baskets of food. Not many migrated in the hunt for illusory jobs elsewhere and with its skilled staff intact the company was quick to stand erect when the clouds passed.

Lukens practices the principle that the welfare of company and employee is interwoven. It has accepted without reluctance the responsibility that comes with being the main support of a community. In 1948 the Lukens payroll was \$17,931,000 and retail sales in Coatesville totaled \$21



ANOTHER LUKENS FIRST: What is reportedly the world's largest head, 20 ft, 4 7/32 in. diameter, is spinning on Lukens Steel Co.'s giant flanging machine. It is pre-heated at a nearby furnace and formed of Lukens Stainless-Clad Steel.

million. Of every sales dollar 99¢ is drawn from outside the county. Father and son teams are commonplace in Lukens and of its 4000 employees, about 1000 of them have at least 20 years service.

They Grow Together

As Lukens grows so grows Coatesville and canny townspeople admit that were it not for Lukens money the community would be a specter of itself. Every year another street sprouts houses and stores in expansion coincidental to that of Lukens.

Along a path traveled by giants, Lukens must be alert to capture its share of business. The 140-year-old firm has none of the senility of great age although it has held the shrewdness. Competitors suspect that Lukens has more than a crystal ball in anticipating trouble and divining market trends.

Before the war when Lukens employed about 2500 men, it was primarily a producer of steel plate and boiler heads. In the space of a decade Lukens underwent a metamorphosis that has made it a manufacturer of finished components and welded machines. Shedding the war labor surplus, Lukens employs 4000 men and the scope of its operations is considerably enlarged.

Built Biggest Plate Mill

From a minor beginning as the Brandywine Mill in 1810, Lukens is a tri-division plant. It was first to roll plate in America and its metal went on the Codorus, the first iron-clad steamboat. It was first to make alloy steel plates and first in America to make clad steel plates, introducing Nickel-Clad steel plate in 1930 and now sponsoring Stainless-Clad steel.

In 1918 Lukens built the world's largest plate mill, a 206-in. four decker, still unchallenged for size. The flanging department spins the widest and heaviest steel heads—over 20 ft diameter, 6 in thick, and weighing 17 tons. The prototype spinning machine was installed there in 1885 and when it did not perform satisfactorily C,h arles Lukens Huston, now first vice president, redesigned it. The company has the largest sodium hydride plant to remove scale from clad steel plates.

Continuing Integration

Lukens began to build a firmer pedestal for itself in 1927 with the formation of the By-Products Div. to semi-finish steel plate parts as a service to customers. Out of scrap from the plates it made nuts, bolts, blanks, washers, etc., and kept scrap for charging its open hearths.

Since Lukens now had a department that could partially prepare steel plates for fabrication by shearing, bending, pressing, blanking, and flame cutting, the next logical step was a plant that would complete the process of

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Structural Steel Bookings Down Slightly

Total February bookings estimated at 110,528 tons, compared with 117,834 tons in January . . . Tops same pre-war period.

New York-The estimated total bookings of fabricated structural steel for February amounted to 110,528 tons, according to reports received by the American Institute of Steel Construction, Inc. They dropped off slightly from the January total of 117,834 tons, but exceeded the figure for February, 1949. The first 2 months' bookings for 1950 were some 12 pct over the same months in the average pre-war years 1936/1940.

February shipments were 122,-614 tons, also slightly off from January. However, the two months' total of 256,044 tons compares most favorably with the 181,204 tons shipped in the corresponding months in the five prewar years.

The backlog (tonnage available for future fabrication) for the next four months only, stands at 565,428 tons.

Following is the complete tabulation of bookings and shipments:

Estimated Total Tonnage for the Entire Industry

CONTRAC	1950 TS CLOSED	1949	Avg. 1936/1940
Jan. Feb.	117,834* 110,528	130,418 108,764	107,578 96,280
Totals SHIPMENT	228,362 IS	239,182	203,858
Jan. Feb.	133,430* 122,614	$152,746 \\ 145,879$	92,578 88,626
	256,044 AVAILABLE BRICATION	298,625	181,204
WITHIN	THE NEXT MONTHS 565,428	683,224	304,277

Fabricated steel awards this week included the following:

- 6000 Tons, Harrisburg, Pa., Foote St. bridge, Pennsylvania Dept. of Highways, Booth & Flynn, Pittsburgh, low bidders on schedule 2.
- 3500 Tons, Beaver County, Pa., Beaver River bridge superstructure, American Bridge Co., Pittsburgh, low bidder.
- 2200 Tons, Kansas City, International Har-vester parts depot, to Allied Structural Steel companies.
- 970 Tons, Milwaukee, service building, Jos. Schlitz Brewery, to Worden-Allen Co., Milwaukee.
- 945 Tons, Boston and Somerville, Mass., two steel stringer bridges and approaches near Sullivan Sq. Contract awarded to West-cott Construction Co., North Attleboro,
- 830 Tons, Wapello County, Iowa, Bridge Project F-359/3/ to Pittsburgh-Des Moines Steel Co., Pittsburgh.

700 Tons, Evanston, Illinois, Washington Life Insurance Co. building to Wendnagel and

Insurance Co. building to Wendnagel and Co., Chicago.

730 Tens, Minneapolis, Bridge Project No. 5589, to Allied Structural Steel Cos.

425 Tons, New York City, Memorial Hospital Building, to Grand Iron Works.

415 Tens, Les Angeles, auditorium, East Los Angeles Jr. College, through Hermann Co., Los Angeles, to Union Steel Co.

393 Tons, Sturbridge, Mass., steel bridge on Route 15. White Oaks Excavators, Plainville, Conn., low bidder.

330 Tons, Denver, Bridge Project FL-FLG-002-1 to Midwest Steel and Iron Works, Denver.

Denver.
325 Tons, Endicott, N. Y., field house for International Business Machines, Inc., to Anthracite Bridge Co., Seranton, Pa.
255 Tons, Dallas County, Iowa, Bridge Project F-366/6/ to Pittsburgh-Des Moines

Steel Co., Pittsburgh.

Tons, Minneapolis, apartment bldg., to
Standard Iron and Wire Works, Chatta-

neoga. 225 Tons, Madison, Wis., Madison Democrat printing building, to Worden-Allen, Mil-

printing building, 10 works, wankee.
200 Tons, Hinsdale, Illinois, high school auditorium, to Allied Structural Steel Cos.
200 Tons, Milwaukee, apartment bldg. to Milwaukee Bridge Co., Milwaukee.
200 Tons, Richmond, Ind., warehouse for Dille and McGuire Co., to Burger Iron Works.

Works.
Tons, Sutton, Northbridge, Douglas and Works.
Tons, Sutton, Northbridge, Dougias and
Uxbridge, bituminous concrete surfacing
and three steel stringer bridges with reinforcing concrete deck slabs, S and M
Construction Co., Providence, R. I., low

185 Tons, Wright County, Iowa, Bridge Project F-013/1/, to Des Moines Steel Co., Des Moines.

175 Tons, Philadelphia, St. Helena's Church, to Easton Steel Structures, Inc., Easton,

to Easton Steel Structures, Inc., Easton, Pu.

150 Tons, Benton County, Minnesota, Bridge Project No. 6590, to American Bridge Co.

149 Tons, Green County, Tenn., Nolichacky River Bridge for Tennessee Highway Department, to Virginia Bridge Co., Birmingham, through Oman Constructon Co., Nashville, contractor.

140 Tons, Stearns County, Minnesota, Bridge Project No. 6460, to American Bridge Co.

130 Tons, Fremont County, Iowa, Bridge Project No. ERS-18/2/, to Des Moines Steel Co., Des Moines.

125 Tons, Rehoboth, Del., repairs to Charles W. Cullen Bridge, Delaware Dept. of Highways, Baltimore Contractors Co., Baltimore, lew bidder.

120 Tons, Chicago, building for Packit Euvelope and Bag Co., to Hansell-Eleock Structural Steel Co., Chicago.

115 Tons, Bristol, Pa., laboratory building for Rohm & Haas, Inc., to Max Corchin Sons Co., Philadelphia.

115 Tons, Dale County, Ala., bridge for Ala-

115 Tons, Dale County, Ala., bridge for Alabama Highway Department, to Virginia Bridge Co., Birmingham, through Goodwyn & Murphree, Troy, Ala., contractor.

Fabricated steel inquiries this week included the following:

2900 Tons, Salem & Gloucester Counties, N. J.,
New Jersey Turnpike Authority, Section
1(3), due Apr. 11.
533 Tons, Lawrence County, Pa., construction
of an I-beam bridge, New Castle, Pa. Secretary of Highways, Harrisburg, Pa. Bids
to April 14.

500 Tons, Lawrence County, Pa., Pennsylvania Dept. of Highways, LR 79 spur, due Apr.

14.
498 Tons, Los Angeles, construction on Anaheim-Telegraph Rd., across Rio Hondo channel, California Div. of Highways, Los Angeles, bids to Apr. 20.
472 Tons, Allegheny County, Ps., completion of the construction of two ventilation buildings located at and over the portals of Senieral Hill Tunnel.

of Squirrel Hill Tunnel.

470 Tons, Allegheny County, Pa., ventilating building, Squirrel Hill Tunnel, Pennsylvania Dept. of Highways, due Apr. 14.
412 Tons, Sacramento, Walnut Grove bridge, County Clerk, Sacramento, bids to Apr. 5.
313 Tons, New Haven, Conn., three span composite welded girder bridge. Relocation of U. S. Route 1. E. T. Nettleton, New Haven, resident engineer of construction.
223 Tons, El Dorado Co., Calif., bridge near Lotus, California Div. of Highways, Sacramento, bids to Apr. 19.
116 Tons, Yuma Co., Aris., overpass and approaches near Welton, State Highway Commission, Phoenix, bids to Apr. 6.
100 Tons, Philadelphia, brewhouse, through W. F. Koeile Sons, Philadelphia.

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Reinforcing bar awards this week included the following:

week included the following:

2700 Tons, Philadelphia, International Airport,
John McShain, Philadelphia, low bidder.

2623 Tons, Boston, Reconstruction of Sullivan
Sq. and vicinity through M. DeMatteo
Construction Co., Quincy, Mass., to Truscon Steel Co., South Boston, Mass.

1352 Tons, King and Kittitas Cos., Wash., snowsheds on State Highway 2, Airplane Curre
and Lake Keechelus, to Northwest Steel
Rolling Mills.

750 Tons, Minneapolis, Veterans Hospital, to
Jos. T. Ryerson and Son, Chicago.

675 Tons. Philadelphia, tubercular patients
building, No. 10, Philadelphia General
Hospital, Wark & Co., Philadelphia, low
bidder.

600 Tons, Philadelphia, Southwest main gravity sewer, through Joseph Lombardi &
Sons, Philadelphia, to Bethlehem Steel
Co., Bethlehem.

ity sewer, through Joseph Lombardi & Sons, Philadelphia, to Bethlehem Steel Co., Bethlehem.

365 Tons, Chicago, Goldblatt Store, to Concrete Steel Co., New York.

305 Tons, Chicago, Goldblatt Store, to Concrete Steel Co., New York.

305 Tons, Los Angeles, auditotrium, East Los Angeles Jr. College, through Hermann Co., Los Angeles, to Truscon Steel Co.

200 Tons, York County, Pa., Route 333 Section 6b and 6e, to Central Pennsylvania Quarry, Stripping and Construction Co., Hazelton, Pa.

175 Tons, Cleveland, building for Dabro Co., to U. S. Steel Supply Co., Chicago.

140 Tons, Barnstable, Mass., new road and bridge through Campanelli and Cardi Construction Co., Hillagrove, R. I., to Truscon Steel Co., South Boston, Mass.

129 Tons, Sturbridge, Mass., steel bridge on Route 15 (Boston-New York highway). White Oaks Excavators, Plainville, Conn., low bidder.

low bidder.

100 Tons, Minneapolis, home economics building, University of Minnesota, to Husted Co., Minneapolis.

Reinforcing bar inquiries this week included the following:

1062 Tons, Newman, Calif., Newman wasteway construction, Delta-Mendota canal, Bareau of Reclamation, Tracy, Calif., Spec. No. 2951, bids to Apr. 18.
950 Tons, Chicago, apartment building, Oakdale and Sheridan Road.
350 Tons, Beaver County, Pa., Pennsylvania Turnpike section.
310 Tons, Akron, Akron Express Highway section.

tion.

270 Tons, Cumberland County, Pa., Susque-banna River Bridge.

140 Tons, Madison, Wisconsin, University of Wisconsin stadium addition.

118 Tons, San Bernardino Co., Calif., two bridges near Running Springs, California Div. of Highways, Los Angeles, bids to Apr. 20.

Steel Stock Split Approved

Pittsburgh-A stock split on a three-for-one basis was approved by the stockholders of the National Steel Corp. recently. They voted more than 80 pct of the outstanding stock in favor of the split while less than one-tenth of 1 pct of outstanding stock went against it. The amendment will become effective on Mar. 30 after filing with Delaware.

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MARKET

IRONAGE
FOUNDED 1855
MARKETS & PRICES

Briefs and Bulletins

production overtures—Three steel companies prepared to increase production by blowing in three blast furnaces and starting another open hearth. Two blast furnaces out of production since June '49 were blown in by Carnegie-Illinois Steel Corp. They were No. 4 furnace at the Edgar Thomson Works and Ohio furnace No. 5. The Alan Wood Steel Co. blew in No. 2 blast furnace last week after running its inventory of foundry iron down. Lukens Steel Co. placed its ninth openhearth into production this week.

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life saver—Conversion business was a life saver for a Pittsburgh district mill whose rolling mills were back on a regular schedule only last week, about 2 weeks after the coal miners returned to work. The rolling mills were running on part-time schedule earlier, however, turning out conversion tonnage which helped bridge the gap until the company's own steelmaking facilities could be stepped up to normal output.

signs of strength—Some signals of strength are being given by the eastern plate market—previously very weak. Small backlogs are beginning to build up on reduced operating schedules. The demand improvement reflects a renewal of railroad car-building orders. The export market is all but lost to the small mills. Available tonnage is being taken by export divisions of the large mills.

publishes extras—Carnegie-Illinois Steel Corp. has published gage and width extras on hot rolled carbon steel sheets over 72 in. wide. Widths over 73 in. within manufacturing limits can only be supplied in cut lengths with cut edges. The published side cutting extra will apply. Previously, extras on widths over 72 in. had been arranged on an individual basis.

on the ebb—While imports from Britain are on the upgrade, some slackening in Canadian demand for American steel is reported. American exports into Canada are running behind last year's. Warehouses report sustained demand for nearly all steel items. The only real shortage is in galvanized sheets.

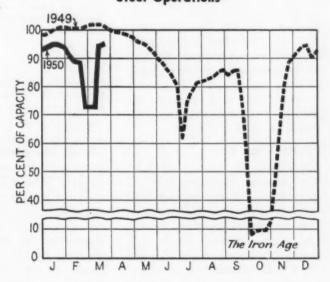
demand—Pipe demand is reported to be almost as strong as that for sheet steel, and is coming from all types of pipe consumers. Like sheet, pipe capacity is expected to be booked through the third quarter when books are opened. A shortage of nails also seems to be developing.

coke prices—Foundry coke was advanced 80¢ a ton by Alan Wood Steel Co. effective Mar. 27, bringing the price to \$21.20 f.o.b. Swedeland, Pa. The Philadelphia Coke Co. is still holding its price of \$20.45 f.o.b. Philadelphia. It is not expected to advance before Apr. 1.

cutting prices—At prices \$10.00 and more a ton under domestic levels, ferromanganese imports are beginning to come into the domestic market picture. Thus far only two shipments have been reported—a total of five carloads.

still paying—Steel companies are still paying through the nose for the coal strike, both in terms of production lost and money being spent for fuel. One producer is still buying considerable tonnages on the open market to build up inventories.

Steel Operations



District Operating Rates—Per Cent of Capacity

-														
Week of	Pittsburgh	Chicago	Youngstown	Philadelphia	Cieveland	Buffalo	Wheeling	South	Detroit	West	Ohio River	St. Louis	East	Aggregate
March 19 March 26	98.0° 96.5	101.0° 101.0	84.5* 86.0	80.0 82.0	99.0° 95.0	104.0 104.0	102.5 104.0	103.0 102.0	106.0° 105.0	93.0 95.4	85.0 80.0	88.9 88.9	98.6 98.6	95.0 96.5

^{*} Revised.

Nonferrous Metals outlook

Market Activities

Chile mine strike threatens copper market...Domestic market very strong...Brass mill backlogs rise...Zinc up 1/4¢...Tin market not strengthened by light buying.



(Cen 8h 0.188

\$1.31 higher 0.311 21/5 to % 20,00 Ex flats, 11/4 higher 30,00 Ex

weig size to 3. to 5. 8.6 i 19.5 43¢. ft oi 1.80 lb. Exoutsi \$1.14

Arc

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John anthony

New York — The unauthorized mine strike at Chuquicamata, Chile, was still in effect early this week with a strike-born loss of copper production estimated at 500 tons a day. So far the strike has not spread to other Chile operations. But the loss of copper from this operation, if continued, could have an important effect on the domestic market. The United States is dependent on shipments of about 35,000 tons a month from Chile, to meet the present rate of copper demand.

Mill Backlogs Rise

Bookings of copper slowed down some in the latter part of last week. But the market was still very strong. Sales for shipment in March reached 105,000 tons with another week still ahead. When the backlog of about 10,500 tons is added, it appeared that March might reach 118,000 tons. Sales for April delivery had reached 61,000 tons by the end of last week. This would indicate still another heavy tonnage month.

Fabricator statistics for February, calculated on the basis of copper content of products, indi-

NONFERROUS METALS PRICES

	Mar. 22	Mar. 23	Mar. 24	Mar. 25	Mar. 27	Mar. 28
Copper, electro, Conn	18.50	18.50	18.50	18.50	18.50	18.50
Copper, Lake, Conn	18.625	18,625	18,625	18.625	18.625	18.625
Tin, Straits, New York	77.50	77.75	77.50		77.25	77.00°
Zinc, East St. Louis	10.00	10.00	10.00	10.00	10,25	10.25
Lead, St. Louis	10.30	10.30	10.30	10.30	10.30	10.30
Note: Quotations are going price	M.					
* Tentative.						

cate how the brass mill business is booming. The backlog of unfilled orders has grown to 195,860 tons, a rise of nearly 20,000 tons from the January low point. Deliveries of fabricated products to customers totaled 102,896 tons (copper content). Although this was 6000 tons lower than January shipments, this was the result of the short month as daily average shipments in February were higher than January. Fabricators' stocks of refined copper grew to 363,924 tons, with 91,828 tons on order. Less working stocks of 286,976 tons, the remainder was 27,084 tons short of meeting unfilled order requirements.

The price of Prime Western zinc advanced another ¼¢ per lb to 10¼¢ East St. Louis on Mar. 27. The demand for Prime West-

ern is quite active, reflecting the need to build up inventories after the end of the coal strike.

Lead Market Weak

There was some domestic business done in lead last week, postponing inevitable price reduction in the market in the face of the foreign offerings. Foreign business was inactive. The smelting charge on battery plates is being maintained at \$55 to \$60 a ton, indicating the anticipation of early price reduction in the domestic market.

The tin market was strong last week based on the strength of the Singapore market. Buying here was very light and contributed no strength to the market. Early this week the price had dropped slightly to 771/4¢.

MILL PRODUCTS

Aluminum

Base prices, cents per pound, base 30,000 lb, f.o.s. shipping point, freight allowed)
Fint Sheet: 0.188 in., 2S, 3S, 26.9¢; 4S, 61S-0, 28.5¢; 52S, 30.9¢; 24S-0, 24S-OAL, 29.8¢; 75S-0, 75S-OAL, 36.3¢; 0.081 in., 2S, 3S, 27.9¢; 4S, 61S-0, 30.2¢; 52S, 32.3¢; 24S-0, 24S-OAL, 30.9¢; 75S-0, 75S-OAL, 38¢; 0.032 in., 2S, 3S, 29.5¢; 4S, 61S-0, 33.5¢; 52S, 36.2¢; 24S-0, 24S-OAL, 37.9¢; 75S-0, 75S-OAL, 47.6¢.

24S-O, 24S-OAL, 37.9¢; 75S-O, 75S-OAL, 47.6¢: ¼ in., and heavier: 28, 3S, F, 23.8¢; 4S-F, 25¢; 52S-F, 27.1¢; 61S-O, 26.6¢; 24S-F, 24S-FAL, 27.1¢; 75S-F, 75S-FAL, 33.9¢.

Extruded Solid Shapes: Shape factors 1 to 4, 33.6¢ to 64¢; 11 to 13, 34.6¢ to 76¢; 23 to 25 36.7¢ to 31.05; 35 to 37, 44¢ to 31.53; 47 to 49, 43.5¢ to \$2.20.

Rod, Relled: 1.5 to 4.5 in., 2S-F, 3S-F, 34¢ to 30.5¢; Cold-finished, 0.375 to 3 in., 2S, 3S, 36.5¢ to 32¢.

Serew Machine Stock: Rounds, 11S-T3, R317-T4; ½ to 11/32 in., 49¢ to 38¢; ½ to 1½ in., 57.5¢ to 35.5¢; 19/16 to 3 in., 85.5¢ to 32.5¢; 17S-T4 lower by 1¢ per lb. Base 5000 lb.

Drawn Wire: Coiled, 0.051 to 0.374 in.; 2S, 36¢ to 26.5¢; 52S, 44¢ to 32.5¢; 65S, 47¢ to 38.5¢; 17S-T4, 50¢ to 34.5¢; 61S-T4, 44.5¢ to 34¢; 75S-T-6, 76¢ to 55¢.

Magnesium

(Cents per lb, f.o.b. mill, freight allowed)

Cents per 1b, f.o.b. mill, freight allowed)

Sheets and Plate: Ma. FSa, ¼ in., &4¢-56¢:
6.188 in., 56¢-58¢: B & S gage 8, 58¢-60¢:
10, 59¢-61¢: 12, 63¢-65¢: 14, 69¢-74¢: 16,
66¢-81¢: 18, 84¢-89¢: 20, 96¢-\$1.01: 22, \$1.22-\$1.31: 24, \$1.62-\$1.75. Specification grade higher. Base: 30,000 lb.

Extruded Round Rod: M, diam in., ¼ to 0.311, 58¢: ½ to ¾, 46¢: 1¼ to 1.749, 43¢: 2½ to 5, 41¢. Other alloys higher. Base: Up to ¾ in. diam., 10,000 lb; ¾ in. to 1¾ in., 20,000 lb: 1½ in. and larger, 30,000 lb.

Extruded Square, Hex. Bar: M, size across flats, in., ¼ to 0.311, 61¢: ¼ to 0.749, 48¢: 1¼ to 1.740, 44¢: 2½ to 4, 42¢. Other alloys higher Base: Up to ¾ in. diam, 10,000 lb; ¼ in. to 1¾ in., 20,000 lb; 1¾ in. and larger, 30,000 lb.

Extruded Solid Shapes, Rectangle: M, in weight per ft, for perimeters of less than size indicated, 0.10 to 0.11 lb per ft, per. up to 5.9 in., 55¢ 0.22 to 0.25 lb per ft, per. up to 5.9 in., 55¢ 0.22 to 0.25 lb per ft, per. up to 5.9 in., 51¢: 0.50 to 0.59 lb per ft, per. up to 8.6 in., 47¢: 1.8 to 2.69 lb per ft, per. up to 1.95 in., 44¢: 4 to 6 lb per ft, per. up to 2.8 in., 44¢: 4 to 6 lb per ft, per. up to 1.95 in., 44¢: 4 to 6 lb per ft, per. up to 1.95 in., 44¢: 4 to 6 lb per ft, per. up to 1.95 in., 44¢: 4 to 6 lb per ft, per. up to 1.95 in., 44¢: 4 to 6 lb per ft, per. up to 1.95 in., 44¢: 4 to 6 lb per ft, per. up to 1.95 in., 44¢: 4 to 6 lb per ft, per. up to 1.95 in., 44¢: 4 to 6 lb per ft, per. up to 1.95 in., 45¢ 0.22 to 0.59 lb per ft, per. up to 1.95 in., 45¢ 0.25 lb per ft, per. up to 1.95 in., 45¢ 0.25 lb per ft, per. up to 1.95 in., 45¢ 0.25 lb per ft, per. up to 1.95 in., 45¢ 0.25 lb per ft, per. up to 1.95 in., 45¢ 0.25 lb per ft, per. up to 1.95 in., 45¢ 0.25 lb per ft, per. up to 1.95 in., 45¢ 0.25 lb per ft, per. up to 1.95 in., 45¢ 0.25 lb per ft, per. up to 1.95 in., 45¢ 0.25 lb per ft, per. up to 1.95 in., 45¢ 0.25 lb per ft. per. up to 1.95 in., 45¢ 0.25 lb per ft. per. up to 1.95 in., 45¢ 0.25 lb per ft. per. up to 1.95 in., 45¢ 0.25 lb per ft. per. up to 1.95 i

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b. Extruded Round Tubing: M, wall thickness, outside diam. in., 0.049 to 0.087, ½ to 5/16, \$1.14: 5/16 to %, \$1.02; ½ to %, 76¢: 1 to 2 ln., 65¢: 0.065 to 0.082, % to 7/16, 85¢; ¾ to %, 62¢: 1 to 2 in., 57¢: 0.165 to 0.219, % to %, 62¢: 1 to 2 in., 53¢: 3 to 4 in., 49¢. Other alloys higher. Base, OD in in.: Up to 1½ in., 10,000 lb; 1½ in. to 3 in., 20,000 lb; 8 in. and larger, 80,000 lb.

Nickel and Monel

(Base prices, cents per lb. fo.b. mill)

		-		-	., ,	
Sheets, cold-rolled					Nickel 60	Monel 47
Strip, cold-rolled .					66	50
Rods and bars	9				56	45
Angles, hot-rolled					56	45
Plates					5.8	46
Seamiess fubes					89	80
Shot and blocks .	0		0.			40

Copper, Brass, Bronze

(Cents per lb, freight prepaid on 200 lb)

		Extruded
Sheets	Rods	Shapes
Copper 32.18		31.78
	28.03	
Copper, h-r		
Copper, drawn.	29.28	33.03*
Low brass 30.12	29.81	33.03*
Yellow brass., 28.69	28.38	31.70*
Red brass 30.60	30.29	33.51*
Naval brass 33.51	27.57	28.82
Leaded brass.	23.19	27.22
Com'l bronze 31.61	31.30	34.27*
Manganese		
bronze 37.01	30.92	32.42
Phosphor		
bronze 50.90	51.15	
	27.14	28.39
Muntz metal. 31.58	21.14	28.39
Everdur, Her-		
culoy, Olym-		
Dic, etc 37.19	36.14	
Nickel silver,		
10 pet 39.66	41.87	46.80
Arch hyonge		
Arch. bronze		27.22
*Seamless tubing.		

PRIMARY METALS

(Cents per lb, unless otherwise noted)
Aluminum, 99+%, 10,000 lb, freight
allowed 17.00
Aluminum pig
Antimony American Laredo Ter 24 50
Parvilium conner 275-4950 Re
dollars per lb contained Be\$24.50
Demillion of De dellars
Beryllium aluminum 5% Be, dollars
per lb contained Be\$52.00
Bismuth, ton lots \$2.00
Cadmium, del'd \$2.00 Cobalt, 97-99% (per lb)\$1.80 to \$1.87
Cobalt, 97-99% (per lb)\$1.80 to \$1.87
Copper, electro, Conn. Valley 18,50
Copper, lake, Conn. Valley18.625
Gold, U. S. Treas., dollars per oz \$35.00
Indium, 99.8%, dollars per troy oz. \$2.25
Iridium, dollars per troy oz\$100 to \$110
Tood St Louis per troy 02 #100 to #110
Lead, St. Louis 10.30
Lead, New York
Magnesium, 99.8+%, f.o.b. Freeport, Tex. 20.50
Tex 20.50
Magnesium, sticks, 100 to 5000 lb
36¢ to 38¢
Mercury, dollars per 76-lb flask
f.o.b. New York
Nickel, electro, f.o.b. New York 42.97
Nickel, electro, f.o.b. New York 42.97 Palladium, dollars per troy oz. \$24.00
Platinum, dollars per troy oz \$66 to \$69
Silver, New York, cents per oz 73.25
The New York, Cents per Ca 15.40
Tin, New York
Zinc, East St. Louis 10.25
Zinc, New York 10.97
Zirconium copper, 10-12 pct Zr, per
lb contained Zr\$12.00

REMELTED METALS

Brass Ingot

(Cents per lb delivered, carloads)
 (Cents per lb delivered, carloads)

 85-5-5-5 ingot
 16.75-18.25

 No. 115
 16.25-17.75

 No. 120
 16.25-17.75

 No. 123
 15.75-17.25

 80-10-10 ingot
 21.75

 No. 305
 21.75

 No. 315
 19.75

 83-10-2 ingot
 27.75

 No. 210
 27.75

 No. 245
 25.25

 No. 245
 18.25-21.00

 Yellow ingot
 No. 405
 14.25-16.00

 Manganese bronze
 No. 421
 20.75

Aluminum Ingot

(Cents per lb. lot of 30,000 lb)

95-5	alu	m	ix	ı	I	n	-5	ai	1	ic	0	n	1	8	ıl	10	01	VI	8						
0.30) c	OI	or	e	r		1	n	a	X											18.3	25-	1	8.	75
0.60) c	ol	I	e	r,		1	n	a	X			0						۰	0	18.0	00-	1	8.8	50
Pistor																									
No. 1:	2 a	lu	n	n.	(V	0		2		g	r	a	d	0)				15.	75-	1	6.2	25
108 a																									
195 a	lloy	7	0			0	۰	0		0	0	0			0				0	6	17.3	25-	1	7.	75
13 all																									
AXS-	679																				16.7	75-	11	7.5	25

Steel deoxidizing aluminum, notch-bar granulated or shot

Grade	1-95-97%	9%		0						17.50-18.00
Grade	2-92-95%									16.50-17.00
Grade	3-90-92%				0	0	0		0	15.50-16.00
Grade	4-85-90%		_							15.00-15.50

ELECTROPLATING SUPPLIES

Anodes

(Cents per lb, freight allowed, in

200 10 1018)	
Copper	
Cast, oval, 15 in. or longer	351/6
Electrodeposited	29 %
Rolled, oval, straight, delivered	33
Forged ball anodes	34
Brass, 80-20	31
Cast, oval, 15 in. or longer	1714
Zinc, oval, 99.886, f.o.b. Detroit Ball anodes	16%
Nickel 99 pct plus	10 18
Cast	59.00
Rolled, depolarized	60.00
Cadmium	\$2.15
Silver 999 fine, rolled, 100 oz lots,	44.70
per troy oz, f.o.b. Bridgeport,	
Conn.	79
Chemicals	
(Cents per lb. f.o.b. shipping poi	nt)
(Cents per lb, f.o.b. shipping poi Copper cyanide, 100 lb drum	46 14
Copper sulfate, 99.5 crystals, bbl	12.00
Nickel salts, single or double, 4-100	
lb bags, frt allowed	18.00
Nickel chloride, 300 lb bbl	
Silver cyanide, 100 oz lots, per oz.	59
Sodium cyanide, 96 pet domestic	10.05
Zinc sulfate, 89 pct granular	7.15
Zinc sunate, 55 pet granular	38.00

SCRAP METALS

Brass Mill Scrap (Cents per pound; add 1/4 t per lb for shipments of 20,000 to 40,000 lb; add

	TE	jor	771	0	re	5	1	Z.	н	b1	•		31	,000 10	Turn
														Heavy	ings
Copper					6		0				0			15 1/2	14%
Yellow	bi	rass						0		0	0	9	0	1236	11%
Red br														14	13%
Commo	erc	ial t	TO	O	3	e				0				14%	13%
Manga														12	11%
Leaded	l b	rass	I	0	đ		e	n	d	8		0		12%	
	-				_			-							

| Custom Smelters' Scrop | (Cents per pound, carload lots, delivered to refinery) | No. 1 copper wire | 15.26 | No. 2 copper wire | 14.25 | Light copper | 13.26 | Refinery brass | 13.50 | Rediators | 9.76 |

Ingot Makers' Scrap
(Cents per pound, carload lots, delivered

(course her house) carroad sore!	4000000
to producer)	
No. 1 copper wire	15.26
No. 2 copper wire	14.25
Light copper	13.25
Digit copper	12.50
No. 1 composition	
No. 1 comp. turnings	12.00
Rolled brass	10.50
Brass pipe	11.00
	9.75
Radiators	
Heavy yellow brass	9.50
Aluminum	
Mixed old cast	9.25- 9.50
Mine d -13 -14-	9.25- 9.50
Mixed old clips	
Mixed turnings, dry	6.50- 7.00
Pots and pans	9.25- 9.50
Tama assessed	1.00-11.50
Low copper 1	1.00-11.00

Dealers' Scrap (Dealers' buying prices, f.o.b. New York in cents per pound)

Copper and Brass

Aluminum Zinc

New zinc clippings
Old zinc
Zinc routings
Old die cast scrap

Nickel and Monel	
Pure nickel clippings	21 -23
Clean nickel turnings	
Nickel anodes	
Nickel rod ends	
New Monel clippings	12 -14
Clean Monel turnings	8 - 9
Old sheet Monel	
Old Monel castings	
Inconel clippings	1113
Nickel silver clippings, mixed	8 10
Nickel silver turnings, mixed	6 - 7
Lead	

read
Soft scrap, lead 8 - 81/4
Battery plates (dry) 3%-4
Magnesium
Segregated solids 9 -10
Castings 51/2 61/4
Miscellaneous

DIOCK LIN	-02
No. 1 pewter 38 -	-40
	-37
	- 814
Solder joints 11 -	-11%
	-42
Small foundry type 10 1/2-	
Monotype 91/2-	-10
	- 91/4
Electrotype 8 -	
New type shell cuttings 1114-	-11%
Hand picked type shells 4 -	- 41/4
	- 4
Electro, dross 24-	- 214



Scrap Prices Continue Upward Trend

The market continues its upward movement this week in most sectors of the country. The price of No. 1 heavy melting steel went up in Pittsburgh, Cleveland, Youngstown, Boston and Detroit. Buying is being done on a sane basis and a runaway market is not expected. The strong demand is expected to continue into April.

THE IRON AGE scrap steel composite price reached \$28.58 per gross ton, an increase of 16¢ per ton over last week's price of \$28.42. This was caused by the increase of 50¢ a ton in the price of No. 1 heavy melting steel at Pittsburgh.

In Detroit much of the interest is being centered on plant scrap lists which are to be awarded this week. It has been forecast that some lists will go at prices at least \$2.00 over current quotations. Industrial lists in Cleveland also are expected to bring from \$1.00 to \$2.00 over this week's quotations.

The overall increases in scrap prices may be attributed to the high rate of steel production since the end of the coal strike. Steel producers are going ahead full blast to satisfy the high demand for most steel products. As long as steel production is high, scrap will command a good price. The yardstick for scrap demand seems to be the ingot rate.

PITTSBURGH—The market undertone was firm again this week. No. 2 bundles were sold at 50 cents a ton higher. Machine shop turnings and short rails were also higher. There were reports of brokers paying up to \$32.50 to cover \$32.50 orders—but not enough yet to be called representative. At press time the evidence did not indicate an increase in No. 1 steel. Any reference to such an increase on P. 15 of this issue should therefore be ignored.

CHICAGO—The higher buying price of one consumer for heavy melting steel and No. 2 bundles were confirmed as a second major consumer in the area bought representative tonnages at the new level. Blast furnace grades have not firmed with the open hearth scrap as yet. A printing error mixed up scrap rail prices last week. Quotation on rerolling rails should have been 44-45, and rails 2 ft and under, 39-40.

PHILADELPHIA—There were advances in some grades of scrap in this market last week, but major grades remained unchanged. Low phos and several cast grades were up \$1.00 a ton. Mixed turnings and heavy turnings were up 50¢. Rall crops were up \$1.50. There is still an underlying shortage of steel scrap grades in this market. But No. 2 bundles are plentiful. Scrap is moving freely from dealers yards at the increased prices of two weeks ago, limited only by the mills' unwillingness to take bundles.

NEW YORK-The market is active in this area. Demand continues strong and

is expected to last into April. The price of No. 2 heavy melting went up 50¢ while those of machine shop turnings, mixed borings and turnings, charging box and heavy breakable cast advanced \$1.00. One broker is paying up to \$14.25 for shoveling turnings.

DETROIT—Although local mills are reported to be resisting price increases in this area, broker buying has pushed prices up further as the strong undertone of the market continues. Actual sales are, as in the past, hard to find but limited quantities are moving at the levels indicated, according to trade sources. Much of the interest here is centered on plant scrap lists to be awarded this week. Local sources have predicted some lists will go at prices at least \$2 over current quotations.

CLEVELAND—After an appraisal of all factors, including broker buying prices, openhearth and blast furnace grades are quotable here and in the Valley at \$1 over last week's prices. The market is very strong. Major part of the industrial lists are closing this week and are expected to bring from \$1 to \$2 over this weeks quotations. Mill buyers are ready to meet price competition, but each is reluctant to put out the first order at a higher price.

ST. LOUIS—Anticipating a new buying movement by the mills, brokers have increased their prices 50¢ on No. 2 heavy melting steel and No. 2 bundled sheets. Brokers say they have difficulty on placing orders on old committments by the mills. A better demand for foundry grades has caused some items to be moved up \$1 a ton.

BOSTON—A little undercurrent of activity in steelmaking grades during the past week sent brokers' buying prices up by 25¢ to 50¢ a gross ton here this week. Business is still reported below par and there is the usual unhappiness about volume of orders. What activity there is comes from some new Eastern mill buying. Cast is dull again, following the limited buying a few weeks ago.

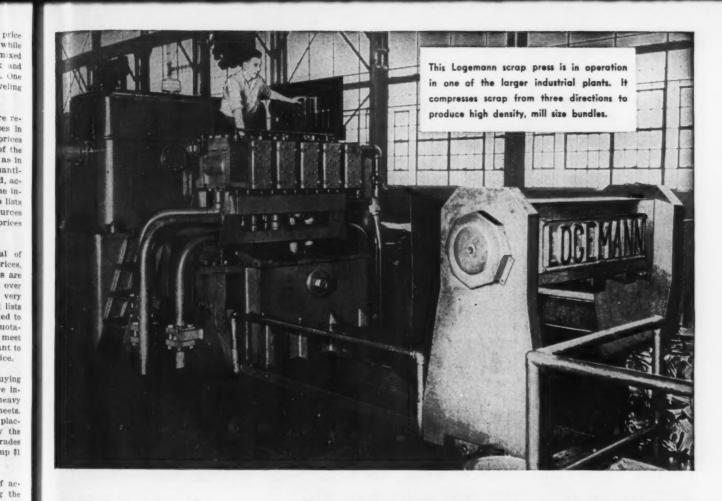
BUFFALO — Fresh buying interest boosted cast scrap prices \$2.00 to \$2.50 a ton during the week. The market moved up gradually to score top gains as additional sales were reported also at smaller advances. Cupola jumped to \$33-33.50 while No. 1 machinery was placed at \$36-\$37. Although the stalemate continued in steel making grades stronger tendencies were in evidence.

Leading mill consumers were again endeavoring to do business within prevailing ranges, but dealers were reluctant to accept orders. Dealers were wary over changes of covering large committment at this time in view of the recent falling off in scrap collection.

cincinnati—No. 2 bundles and No. 2 steel are moving in limited tonnages in an otherwise quiet and unchanged scrapmarket here. Mills are more or less comfortable inventory-wise, but are expected to come in for the April requirements early next week. Foundry grades are in poor demand. Blast furnace material and No. 2 bundles are moving to Portsmouth.

birmingham — Despite advances in other markets, scrap prices in this area have yet to increase. At the beginning of the week, there was little buying of any grade. Receipts were slow at dealers' yards.

1



Self-Contained Triple Compression Automatically Controlled)

LOGEMAN SCRAP PRESSES

handle high tonnages with minimum labor . . . at low cost

LOGEMANN METAL BALERS

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GE

... are built in a large range of sizes to meet specific conditions. Let Logemann's engineering service help you arrive at the most efficient and economical way of handling your scrap.

The compact unit illustrated is completely self-contained with oil tank and pump located directly over the press . . . utilizing the advantages of short pipe lines. Automatic controls, mounted in front of pump, give the operator full visibility at all times. Controls operate rams successively within a single rigid box. There is no complex construction which means there is no need for specially-trained mainte nance crews.

Both two-ram and three-ram models are available with auta matic controls or for manual manipulation.

Logemann Bros. Co. have specialized in the production of scrap metal presses for sheet mills, stamping plants, scrap yards, and metal manufacturing plants of all types for nearly 75 years. Write for full information — please state the nature of your scrap and tonnage.

BROTHERS COMPANY LOGEMANN Milwaukee 10, Wisconsin 3164 W. Burleigh Street

Iron and Steel

Pittsburgh

•		
No. 1 hvy. melting	32.00 to	\$32.50
No. 2 hvy. melting	28.50 to	29.00
No. 1 bundles	32.00 to	32.50
No. 2 bundles	24.50 to	25.50
Machineshop turn	22.50 to	23.00
Mixed bor. and ms. turns.	22.50 to	23.00
Shoveling turnings	24.50 to	25.00
Cast iron borings	24.50 to	25.00
Low phos. plate	34.00 to	34.50
Heavy turnings	27.00 to	28.00
No. 1 RR. hvy. melting	33.00 to	33.50
Scrap rails, random lgth	35.50 to	36.50
Rails 2 ft and under	29.00 to	40.00
RR. steel wheels	35.50 to	36.00
RR. spring steel	35.50 to	36.00
RR. couplers and knuckles	35.50 to	36.00
No. 1 machinery cast	39.00 to	40.00
Mixed yard cast	34.00 to	35.00
Heavy breakable cast	32.50 to	33.50
Malleable	35.00 to	36.00

Chicago

Unitago		
No. 1 hvy, melting	28.00 t 26.00 t 27.00 t 25.00 t 24.00 t 18.00 t 19.00 t 20.50 t	0 27.00 0 28.00 0 27.00 0 25.00 0 19.00 0 20.00 0 21.50
Low phos. forge crops Low phos. plate No. 1 RR. hvy. melting Scrap rails, random lgth Rerolling rails Rerolling rails Locomotive tires, cut Cut bolsters & side frames Angles and splice bars RR. steel car axles RR. couples and knuckles.	32.00 t 30.50 t 30.00 t 34.00 t 45.00 t 39.00 t 31.00 t 35.00 t 42.00 t 32.00 t	33.00 31.50 31.00 35.00 46.00 40.00 35.00 32.00 36.00 43.00
No. 1 machinery cast. No. 1 agricul. cast. Heavy breakable cast. RR. grate bars Cast iron brake shoes Cast iron car wheels Malleable	40.00 to 38.00 to 30.00 to 29.00 to 30.00 to 36.00 to 37.00 to	39.00 31.00 30.00 31.00 37.00

Philadelphia

	-		
No. 1 hvy. melting	24.00	to	\$25.00
No. 2 hvy. melting	22.00	to	23.00
No. 1 bundles	24.00	to	25.00
No. 2 bundles	18.50	to	19.50
Machine shop turn	15.00	to	15.50
Mixed bor, and turn	15.50	to	16.00
Shoveling turnings	18.50	to	19.00
Low phos. punchings, plate	27.50	to	28.50
Low phos. 5 ft and under	27.00	to	27.50
Low phos. bundles	25.00	to	25.50
Hvy. axle forge turn	24.00	to	25.00
Clean cast chem. borings	28.00	to	29.00
RR. steel wheels	29.00	to	30.00
RR. spring steel	29.00	to	30.00
Rails 18 in. and under	37.50	to	38.50
No. 1 machinery cast	36.00	to	37.00
Mixed yard cast	31.00	to	32.00
Heavy breakable cast	34.00	to	35.00
Cast iron carwheels	38.00	to	39.00
Malleable	38.00	to	39.00

Cleveland

No. 1 hvy. melting	29.00	to \$29.50
No. 2 hvy. melting	27.00	to 27.50
No. 1 busheling	29.00	to 29.50
No. 1 bundles	29.00	to 29.50
No. 2 bundles	23.50	to 24.00
Machine shop turn,	19.50	to 20.00
Mixed bor. and turn	22.50	to 23.00
Shoveling turnings	22.50	to 23.00
Cast iron borings	22.50	
Low phos. 2 ft and under	30.00	to 30.50
Steel axle turn	28.00	to 28.50
Drop forge flashings	29.00	to 29.50
No. 1 RR. hvy. melting	32.00	to 32.50
Rails 3 ft and under	42.00	to 43.00
Rails 18 in. and under	43.00	to 44.00
No. 1 machinery cast	42.00	to 43.00
RR. cast	42.00	
RR. grate bars	30.00	
Stove plate	34.00	
Malleable	38.00	

Youngstown

				100	,	-	-	_	-	-			
No.	1	hvy.	melting								\$32.50	to	\$33.00
No.	2	hvy.	melting			0					30.50	to	31.00
No	1	hund	log								29 50	40	22 00

SCRAP PRICES

Going prices as obtained in the trade by THE IRON AGE, based on repre-sentative tonnages. All prices are per gross ton delivered to consumer unless otherwise noted.

No. 2 bundles Machine shop turn.							25.50	to	\$26.00 22.50
Shoveling turnings Cast iron borings		0	0	0	0	0	24.00	to	24.50
Low phos. plate							33.50	to	34.00

Buffalo

	Dullalo			
	No. 1 hvy. melting	\$27.50	to	\$28.00
	No. 2 hvy. melting	25.50	to	26.00
	No. 1 busheling	25.50	to	26.00
	No. 1 bundles	26.50	to	27.00
•	No. 2 bundles	24.00		
	Machine shop turn,	18.00		18.50
	Mixed bor. and turn	19.00		
				21.00
	Shoveling turnings	20.50		
	Cast iron borings	19.50		20.00
	Low phos. plate	29.00	to	29.50
	Scrap rails, random lgth	33.50	to	34.00
	Rails 2 ft and under	38,50		39.00
	RR. steel wheels	33.00		33.50
		33.00		33.50
	RR. spring steel			33.50
	RR. couplers and knuckles	33.00		
	No. 1 machinery cast	36.00	to	37.00
	No. 1 cupola cast	33.00	to	33.50
	Stove plate	32.00		32.50
	Small indus, malleable	30.00		30.50
	Small made. maneable	00.00	-0	00.00

Rirmingham

Dirmingnam	
No. 1 hvy. melting	\$24.00
No. 2 hvy. melting	22.00
No. 2 bundles	20.00
No. 1 busheling	23.00
Machine shop turn\$18.00 to	\$18.50
Shoveling turnings 20.00 to	21.00
Cast iron borings	19.00
Bar crops and plate 27.00 to	28.00
Structural and plate 27.00 to	28.00
No. 1 RR. hvy. melt 26.00 to	
Scrap rails, random lgth 29.00 to	30.00
Rerolling rails 33.00 to	34.50
Rails 2 ft and under 35.50 to	36.00
Angles & splice bars 33.50 to	34.50
Std. steel axles 28.00 to	29.00
No. 1 cupola cast 35.00 to	36.00
Stove plate 30.50 to	
Cast iron carwheels 30.00 to	31.00

St. Louis

31. Louis	
No. 1 hvy. melting\$29.00 to	
No. 2 hvy. melting 24.50 to	25.00
No. 2 bundled sheets 24.50 to	25.50
Machine shop turn 14.00 to	15.00
Shoveling turnings 18.00 to	19.00
Rails, random lengths 32.00 to	
Rails 3 ft and under 37.00 to	
Locomotive tires, uncut 28.00 to	29.00
Angles and splice bars 35.00 to	36.00
Std. steel car axles 41.00 to	43.00
RR. spring steel 31.00 to	
No. 1 machinery cast 37.00 to	38.00
Hvy. breakable cast 31.00 to	32.00
Cast iron brake shoes 29.00 to	30.00
Stove plate 29.00 to	30.00
Cast iron car wheels 35.00 to	36.00
Malleable 33.00 to	

New York

Brokers' buying prices per gre	oss ton, on cars:
No. 1 hvy. melting	
No. 2 hvy. melting	18.00 to 18.50
No. 2 bundles	16.00 to 16.50
Machine shop turn	12.00 to 12.50
Mixed bor. and turn	
Shoveling turnings	13.75 to 14.25
Clean cast chem. bor	23.00 to 24.00
No. 1 machinery cast	28.00 to 29.00
Mixed yard cast	26.00 to 26.50
Charging box cast	
Heavy breakable cast	27.00 to 27.50
Unstrp. motor blocks	19.50 to 20.00

Boston

Brol	kei	rs*	buy	ing	pr	ices	1	pi	ėI	g	r	088	ten,	01	a cars
No.	2	h	vy.	me	lti	ng		0	0			10	5.50	to	\$21.00 17.06 21.00

No. 2 bundles\$15	.25 to \$15.75
Machine shop turn 11	.00 to 11.50
Mixed bor, and turn, 11	.00 to 11.50
Shoveling turnings 13	.00 to 13.50
No. 1 busheling 19	.00 to 19.50
Clean cast chem. borings 18	.00 to 19.00
	.00 to 27.50
	:00 to 23.00
	.00 to 23.00
Stove plate 20	.00 to 21.00

Detroit

Brokers' buying prices per gross ton, on cars:
No. 1 hvy. melting \$24.50 to \$25.00
No. 2 hvy. melting 22.00 to 22.50
No. 1 bundles 26.50 to 27.00
New busheling 24.50 to 25.00
Flashings 24.50 to 25.00
Machine shop turn 16.50 to 17.00
Mixed bor, and turn 16.50 to 17.00
Shoveling turnings 19.00 to 19.50
Cast iron borings 19.00 to 19.50
Low phos. plate 26.50 to 27.00
No. 1 cupola cast 33.00 to 34.00
Heavy breakable cast 26.00 to 27.00
Stove plate 27.00 to 28.00
Automotive cast 37.00 to 38.00

Cincinnati

er gross ton, f.o.b, cars:

a or group ton, arong			
No. 1 hvy. melting	\$26.50	to	\$27.00
No. 2 hvy. melting	32.50	to	23.00
No. 1 bundles	26.50	to	27.00
No. 2 bundles	18.50	to	19.00
Machine shop turn		to	15.50
Mixed bor, and turn,	16.00	to	16.50
Shoveling turnings	17.00	to	17.50
Cast iron borings	17.00	to	17.50
Low phos. 18 in, under	33.00	to	33.50
Rails, random lengths	34.00	to	34.50
Rails, 18 in. and under	42.00		43.00
No. 1 cupola cast	38.00	to	39.00
Hvy. breakable cast	33.00	to	34.00
Drop broken cast	42.00	to	43.00

San Francisco

No. 1 hvy. melting	\$20.0
No. 2 hvy. melting	18.0
No. 1 bundles	16.0
No. 2 bundles	16.0
No. 3 bundles	13.0
Machine shop turn	9.0
Elec. fur. 1 ft and under	28.0
No. 1 RR, hvy. melting	20.0
Scrap rails, random lgth	
No. 1 cupola cast \$30.00	to 35.0

Los Angeles

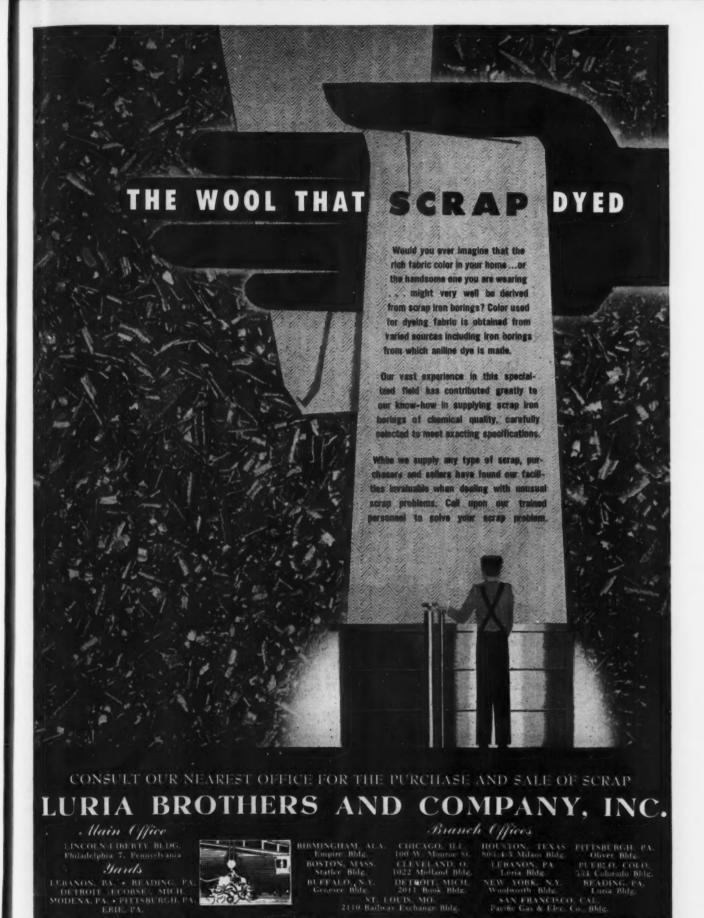
No. 1 hvy.	9334	a14	41	n	oe.			_								\$20.0
No. 2 hvy.																18.0
No. 1 bund	les							0		0						16.0
No. 2 bund																16.0
No. 3 bund																13.0
Mach. shop																
Elec. fur. 1	It	a	n	d	u	m	d	e	r	0						30.0
No. 1 RR. 1	hvy	7.	n	ne	ol	tl	n	g		0						20.0
No. 1 cupol	a	ca	8	t.	,						\$3	2	Į.	60	to	35.0

Seattle

No. 1 hvy	melt	in	æ										\$18.0
No. 2 hvy	. melt	in	g										18.0
No. 1 bun													16.0
No. 2 bun													16.0
No. 3 bun													12.0
Elec. fur.	1 ft a	nd	8	m	d	el	۲.		\$20		00	to	
RR. hvy. 1	neltin.	g						9					19.0
No. 1 cupe													30.0
Heavy bre	eakabl	0	CI	8.4	ıt.					, (20.0

Hamilton, Ont.

No. 1 hvy. melting	\$24.
No. 1 bundles	16.
No. 2 bundles	16.
Mechanical bundles	22.
Mixed steel scrap	20.0
Mixed bor, and turn,	18.
Rails, remelting	24.
Rails, rerolling	27.
Bushelings	18.
Bush., new fact, prep'd	22.0
Bush., new fact, unprep'd	17.0
Short steel turnings \$40.00 to	43.



LEADERS IN IRON AND STEEL SCRAP SINCE 1889

March 30, 1950

15.75 11.50 11.50 13.50 19.50 19.00

27.50 23.00 23.00 21.00

cars:

25.00 22.50 27.00 25.00 25.00 17.00 17.00 19.50

27.00

34.00 27.00 28.00 38.00

7.00 3.00 7.00 9.00 5.50 6.50 7.50

3.50 4.50 3.00 9.00 4.00 3.00

0.00 8.00 6.00 6.00 3.00 9.00 8.00

0.00 0.00 5.00

0.00 8.00 6.00 6.00 8.00

0.00

.00

.00

0

161

Comparison of Prices

Steel prices on this pay f.o.b. quotations of major Chicago. Gary, Cleveland, 1	produ oungs	the ave	rage of	various taburgh,
		Mar. 21,		
(cents per pound)	1950	1950	1950	1949
Hot-rolled sheets	3.35	3.35	3.35	3.26
Cold-rolled sheets				
Columnia de la columnia del columnia del columnia de la columnia del columnia del columnia de la columnia del columnia d	4.10	4.10	4.10	4.00
Galvanized sheets (10 ga)	4.40	4.40	4.40	4.40
Hot-rolled strip	3.25	3.25	3.25	3.265
Cold-rolled strip	4.21	4.21	4.21	4.063
Plates	3.50	3.50	3.50	3.42
Plates wrought iron	7.85	7.85	7.85	7.85
Stains C-R strip (No. 302)	33.00	33.00	33.00	33.25
Tin and Terneplate: (dollars per base box)				
Tinplate (1.50 lb) cokes	\$7.50	\$7.50	\$7.50	\$7.75
Tinplate, electro (0.50 lb)	6.60	6.60	6.60	6.70
Special coated mfg. ternes	6.50	6.50	6.50	6.65
	0.00	0.00	0100	0.00
Bars and Shapes:				
(cents per pound)	0.45	0.45	0.45	
Merchant bars	3.45	3.45	3.45	3.35
Cold-finished bars	4.145	4.145	4.145	3.995
Alloy bars	3.95	3.95	3.95	3.75
Structural shapes	3.40	3.40	3.40	3.25
Stainless bars (No. 302).	28.50	28.50	28.50	28.50
Wrought iron bars	9.50	9.50	9.50	9.50
Wire:				
(cents per pound)				
Bright wire	4.50	4.50	4.50	4.15
Rails:				
(dollars per 100 lb)	00 10	20 40	00.10	00.00
Heavy rails	\$3.40	\$3.40	\$3.40	\$3.20
Light rails	3.75	3.75	3.75	3.55
Semifinished Steel: (dollars per net ton)				
Rerolling billets	54 00	\$54.00	\$54.00	\$52.00
Slabs, rerolling	54.00	54.00	54.00	52.00
Forging billets	63.00	63.00	63.00	61.00
Alloy blooms, billets, slabs	66.00	66.00	66.00	63.00
Wire Rod and Skelp:				
(cents per pound)				
Wire rods	3.85	3.85	3.85	3.463
	3.15	3.15	3.15	3.25
Skelp	0.10	0.10	0.10	3.20

Price advances over previous week are printed in Heavy Type; declines appear in Italics.

			Mar. 29, 1949
			\$51.56
. 46.50	46.50	46.50	46.50
. 49.08	49.08	49.08	49.46
. 42.38	42.38	42.38	43.38
	46.50	46.50	46.00
	49.92	49.92	50.76
	46.00	46.00	46.50
	46.50	46.50	46.50
	46.50	46.50	46.50
	68.56	68.56	73.78
.173.40	173.40	173.40	173.40
	1950 .\$50.42 .46.50 .49.08 .42.38 .46.50 .46.50 .46.50 .68.56	1950 1950 .\$50.42 \$50.42 .46.50 46.50 .49.08 49.08 .42.38 42.38 .46.50 46.50 .49.92 49.92 .46.00 46.00 .46.50 46.50 .46.50 46.50 .68.56 68.56	.\$50.42 \$50.42 \$50.42 . 46.50 46.50 46.50 . 49.08 49.08 49.08 . 42.38 42.38 42.38 . 46.50 46.50 46.50 . 49.92 49.92 49.92 . 46.00 46.00 46.00 . 46.50 46.50 46.50 . 46.50 46.50 46.50 . 68.56 68.56 68.56

†The switching charge for delivery to foundries in the Chicago district is \$1 per ton.
‡Average of U. S. prices quoted on Ferroalloy page.

(per gross tons)			
Heavy melt'g steel, P'gh. \$32.25	\$32.25	\$30.75	\$32.50
Heavy melt'g steel, Phila. 24.50	24.50	23.00	29.50
Heavy melt'g steel, Ch'go 28.50	28.50	27.50	31.50
No. 1 hy. com. sh't, Det 26.75	25.50	22.50	28.50
Low phos. Young'n 33.75	32.75	32.75	34.50
No. 1, cast, Pittsburgh 39.50	39.50	37.50	39.00
No. 1, cast, Philadelphia. 36.50	36.50	35.50	34.50
No. 1, cast, Chicago 40.50	39.50	39.50	38.00

Coke: Connellsville:

		at oven,				
		prompt			\$14.00	\$14.50
Foundry	coke,	prompt	16.25	16.25	15.75	16.50

Nonferrous Metals: (cents per pound to lar		- 7	ta N	
Copper, electro, Conn	18.50	18.50	18.50	23.50
Copper, Lake Conn		18.625	18.625	23.625
Tin Straits, New York		77.125*	74.50	\$1.03
Zinc, East St. Louis		10.00	9.75	16.00
Lead, St. Louis		10.30	11.80	16.85
Aluminum, virgin		17.00	17.00	17.00
Nickel electrolytic		42.97	42.97	42.93
Magnesium, ingot		20.50	20.50	20.50
Antimony, Laredo, Tex		24.50	27.25	38.50
* Revised. + Tentative.				

Composite Prices

Finished Steel Base Price

Starting with the issue of May 12, 1949, the weighted finished steel composite was revised for the years 1941 to date. The weights used are based on the average product shipments for the 7 years 1937 to 1940 inclusive and 1948 to 1948 inclusive. The use of quarterly figures has been eliminated because it was too sensitive. (See p. 139 of May 12, 1949, issue.)

35 00			-	ose Frice		
Mar. 28,	1950		3.83	Te per lb.		
	k ago					
	th ago					
	ago		3.75	2¢ per lb.		
Sept F	ligh			Lo	w	
1950	3.837€	Jan.	3	3.837€		3
1949	3.837€			3.705¢		2
1948	3.721€			3.193€		3
1947	3.193€			2.848€		1
1946	2.848€			2.464€		1
1945						1
1944	2.464¢ 2.3 2.3 2.3 2.3	3964	20	2.0000	396¢	*
1943	2.5	3964		2	396¢	
1942	2.5	3964		2	396¢	
1941	2	3966		2	396€	
1940	2 304674	Jan	2	2.24107€		16
1939	2.35367€					
1938	2.58414¢			2.27207€		
1937	2.58414¢			2.32263€		4
1936	2.32263€					
1935	2.07642¢					
1932				1.83910€		1
1929				2.26498€		
20201111	Weighted	index	ba	sed on st	eel ba	TS.
8	hapes, plat	es, wir	re. r	ails, black	pipe. 1	hot
a	nd cold-ro	iled s	heet	and stri	p, rep	re-
8	enting ma; hipments.	Index	Lec	apitulated	in A	DE.
2	8, 1941, iss	ue and	l in	May 12, 19	49.	-0.

High			Lo	w	
\$46.38 Feb.	. 7	\$	45.88	Jan.	3
46.87 Jan.	18		45.88	Sept.	. 6
46.91 Oct.	12		39.58	Jan.	6 7 1
37.98 Dec.	30		30.14	Jan.	7
30.14 Dec.	10		25.37	Jan.	1
25.37 Oct.	23		23.61	Jan.	2
\$23.61			\$2	3.61	
23.61			2	3.61	
23.61			2	3.61	
23.61 Mar.	. 20	\$	23.45	Jan.	2
23.45 Dec.	23		22.61	Jan.	2
22.61 Sept			20.61	Sept.	12
23.25 June	21	20,	19.61	July	6
23.25 Mar.	. 9		20.25	Feb.	16
19.74 Nov.	24		18.73	Aug.	11
18.84 Nov.	. 5		17.83	May	14
14.81 Jan.	5		13.56	Dec.	6
18.71 May	14		18.21	Dec.	17
Based on	aver	ages	for b	asic i	ron
t Valley fu t Chicago,	rnace	tledal	nhia	Buffe	ron

Pig Iron	Scrap Steel
\$46.38 per gross ton 46.38 per gross ton 46.38 per gross ton 46.74 per gross ton	\$28.58 per gross ton 28.42 per gross ton 27.08 per gross ton 31.17 per gross ton
High Low	High Low
38 Feb. 7 \$45.88 Jan. 3 387 Jan. 18 45.88 Sept. 6 91 Oct. 12 39.58 Jan. 6 98 Dec. 30 30.14 Jan. 7 14 Dec. 10 25.37 Jan. 1 37 Oct. 23 23.61 Jan. 2 \$23.61 23.61 23.61 23.61 23.61 23.61 23.61 23.61 23.61 23.61 25.5 Jan. 2 261 Sept. 19 20.61 Sept. 12 25 June 21 19.61 July 6 25 Mar. 9 20.25 Feb. 16 74 Nov. 24 18.73 Aug. 11 84 Nov. 5 17.83 May 14 81 Jan. 5 13.56 Dec. 6 71 May 14 18.21 Dec. 17 ased on averages for basic iron falley furnaces and foundry iron Chicago, Fyliadelphia, Buffalo, ev and Birmingham.	\$28.42 Mar. 21 \$26.25 Jan. 3 43.00 Jan. 4 19.33 June 28 43.16 July 27 39.75 Mar. 9 42.58 Oct. 28 29.50 May 20 31.17 Dec. 24 19.17 Jan. 1 19.17 Jan. 2 18.92 May 22 19.17 Jan. 11 15.76 Oct. 24 \$19.17 19.17 \$22.00 Jan. 7 \$19.17 Apr. 10 21.83 Dec. 30 16.04 Apr. 9 22.50 Oct. 3 14.08 May 16 15.00 Nov. 22 11.00 June 7 21.92 Mar. 30 12.67 June 8 13.42 Dec. 10 10.33 Apr. 29 8.50 Jan. 12 6.43 July 5 17.58 Jan. 29 14.08 Dec. 8 Average of No. 1 heavy melting steel scrap delivered to consumers at Pittsburgh, Philadelphia and Chicago.

ALTER

hi-

A NAME TO REMEMBER

STAINLESS STEEL

AND ALL GRADES OF NICKEL AND ALLOY SCRAP

Cast Iron
Electric Furnace Grades
Open Hearth
Foundry Steel
Sheet Iron for Baling
Stainless Steel
Non-Ferrous Metals

Over 50 Years
ALTER

1700 ROCKINGHAM ROAD D

DAVENPORT 2, IOWA

STEEL	prices a	p. Journity po	- mppy 0	, to size		produ	ced in these ar	- Pri	are in	per	_ anress		L. Court E	and apply
PRICES	Pittsburgh	Chicago	Gary	Cleve- land	Canton Mas- sillon	Middle- town	Youngs- town	Bethle- hem	Buffaio	Consho- hocken	Johns- town	Spar- rows Point	Granite City	Detroit
INGOTS Carbon ferging, net ton	\$50.00		4		-				-					\$50 .00
Alloy, net ton	\$51.00 1.17													\$51.00 31
BILLETS, BLOOMS, SLABS Carbon, rerolling, net ton	\$53.00	\$53 00	\$53.00				\$57.00		\$53.00	\$58.00 26	\$53.00			
Carbon forging billets, net ton	\$63.00	\$63.00	\$63.00 1.8	\$63.00			\$63.00		\$63.00	\$65.00	\$63.00			\$83.00 31
Alloy, net ton	\$66.00 1.17	\$66.00	\$66.00		\$66.00 4.42		\$66.00	\$66.00	\$88.00	\$68.00	\$66.00			\$66.00 31
SHEET BARS							\$57.00		100					
PIPE SKELP	3.15						3.15							
WIRE RODS	3.85	3.85	3.85	3.85			3.85				3.85	3.95		
SHEETS Hot-rolled (18 ga. & hvr.)	3.35	3.35	3.35	3.35			3.35		3.35	3.45	-	3.35		3.55
Cold-rolled	4.101.8		4.10	4.10		4.10	4.10		4.10			4.10	4.30	4.30
Galvanized (10 gage)	7.9.15.63 4.40	N. 10	4.40	4.15	4.40	7	4.6564 4.7544		3			4.40	22	12
Enameling (12 gage)	1.9.15		4.40	4.40	4	4.40	4.7544					3	4.60	4.70
Long ternes (10 gage)	4.80		4.80	4		4.80	4.9076	-	-				22	12
	9.15	8 00	5.05	5.05		7	5.05	-	5.05	5 OF		8 0F		5.25
Hi Str. low alloy, h.r.	5.05	5.05	1.6.8	4.5			1.4.6.13	-	3	5.05		5.05		12
Hi str. low alloy, c.r.	6.20		6.20	6.20			6.20		6.20			6.20		6.40
Hi str. low alloy, galv.	6.75											6.75		
STRIP Hot-rolled (ever 6 in.)	3.25 5.7.9.28	3.25	3.25	3.25			3.25 1.4.6.13		3.25	3.35		3.25		3.45 12.47
Cold-rolled	4.15 5.7.9.63	4.30	4.30	4.15		4.15	4.15 4.6.13.40.45.49		4.15			4.15		4.4068.8
Hi str. low alloy, h.r.	4.95		4.95 1.6.8	4.95			4.95 1.4.6.13		4.95	4.95		4.95	-	5.15
Hi Str. low alloy, c.r.	8.20			6.20			6.20		8.20			6.20		6.40
TINPLATE† Cokes, 1.50-lb base box 1.25 lb, deduct 20¢	\$7.50 2.5.9.15		\$7.50		The state of the s		\$7.50					\$7.60	\$7.70	
Electrolytic 0.25, 0.50, 0.75 lb box				Deduct	\$1.15, 90¢	and 65¢ r	respectively fro	om 1,50-lb	coke base	e box price	,			
BLACKPLATE, 29 gage	5.30		5.30			-	5.30					5.40	5.50	
Hollowware enameling BARS Carbon steel	3.45	3.45	3.45	3.45	3.45		3.45		3.45		3.45	3	22	3.65
Carbon steel Reinforcing‡	3.45	3.45	3.45	3.45	4	-	3.45	-	3.45		3.45	3.45		12
Cold-finished	4.10 ⁶ 4.15 ² ·4	4.15 ² 28.69.70	4.15 4.73.74	4.15 2.61	4.15	No. of the latest terms of	4.15 6.40.57		4.15 70		3	1		4.35
Alloy, hot-rolled	17.52.69.71 3.95	3.95	3.95	-	3.95		3.95	3.95	3.95		3.95			4.25
Alloy, cold-drawn	4.90	1.4.28	4.90	4.90	4.90		4.90	4.90	4.90		3	-		5.05
Hi str. low alloy, h.r.	2.17.52.69.71 5.20		4.78.74 5.20	2.41 5.20	4.42.83		6.25.57 5.20	5.20	8.70 5.20		5.20			5.40
PLATE Carbon steel	3.50	3.50	3.50 1.6.8	3.50			3.50 1.13	3	3.50	3.60	3.50	3.50		3.75
Floor Plates	4.55	4.55	4.55	4.55		-		-		4.55				
	1	1	3	5		-	4.40			26 4.40	4.40	4.40	-	
Alley	4.40	4.40	4.40				13		-	26	3	1		
Hi Str. low alloy	5.35	5.35	5.35	5.35 4.5			5.35			5.35	3 45	5.35		5.00
SHAPES, Structural	3.40	3.40	3.40					3.45	3.45		3.45			
Hi Str. low alloy	5.15	5.15	5.15 1.6.8				5.15	5.15	5.15		5.15			
MANUFACTURER'S WIRE Bright	4.50	4.50 ² 4.12.33.34		4.50	1		4.50	Kokom	no=4.60 ³⁰		4.50	4.60	Dulut Puebl	th=4.50 ² to=4.75 ¹
PILING, Steel Sheet	4.201.9	4.20							4.20					

3.8

	Smaller numbers indicate producing companie Prices are in cents per lb unless otherwise n		noted. Extras apply.	STEEL	
Kansas City	Houston	Birm- ingham	WEST COAST Seattle, San Francisco, Los Angeles, Fontana		PRICES
					INGOTS Carbon forging net ton
	\$59.00		1		Alloy, net ton
		\$53.00	F=\$72.00 ¹⁹		BILLETS, BLOOMS, SLABS Carbon, rerolling, net ton
	\$71.00	\$63.00	F=\$82.00 ¹⁹	Geneva = \$61.0016	Carbon forging billets, net t
	\$74.00 83		F = \$85.00 ¹⁹		Alloy not ton
	83			Portsmouth = \$55.00 ²⁰	SHEET BARS
					PIPE SKELP
	4.25	3.85	SF = 4.50 ²⁴	Portamouth = 3.85 ²⁰	WIRE RODS
	83	3.35	SF, LA=4.0624	Worcester = 4.15 ² Ashland ⁷ = 3.35	SHEETS
		4.11	F=4.25 ¹⁹ SF=5.05 ²⁴	Niles=3.50 ^{6 4}	Hot-rolled (18 ga. & hvr.)
-		11	F=5.00 ¹⁹	A.U. 4 407	
		4.40	SF, LA = 5.15 ²⁴	Ashland = 4.40 ⁷ Kokomo = 4.50 ³⁰	Galvanized (10 gage)
					Enameling (12 gage)
					Long ternes (10 gage)
		5.05	F=6.7419		Hi Str. low alloy, h.r.
			F=7.0519		Hi Str. low alloy, c.r.
					Hi Str. low alloy, galv.
3.85	3.65	3.25	SF, LA=4.0024.62 F=4.4019, S=4.2562	Ashland = 3.25 ⁷ Atlanta = 3.40 ^{6.5}	STRIP Hot-roiled
			F=5.40 ¹⁹ LA=5.50 ²⁷	New Haven = 4.852 .68	Cold-rolled
		4,93	F=6,6419		Hi Str. low alloy, h.r.
	-		F=6.9510		Hi Str. low alloy, c.r.
		7.60	SF=8.25 ²⁴		TINPLATE Cokes, 1.50-lb base box 1.25 lb, deduct 20¢
D	educt \$1.1	5, 90∉ an	d 65¢ respectively from 1.50)-Ib coke base box price	Electrolytic 0.25, 0.50, 0.75 lb bex
					BLACKPLATE, 29 gage Hollowware enameling
4.05	3.85	3.45	(SF, LA=4.15 ²⁴ LA=4.15 ⁶²	Atlanta = 3.60 ^{6.5}	BARS Carbon steel
4.05	3.85	3.45	SF, S=4.2063 F=4.1016	Atlanta = 3.60°5	Reinforcing:
83	83	4.11	(F=4,10°	Putnam, Newark = 4.5849	Cold-finished
4.55	4.35		LA=5.0062		Alloy, hot-rolled
83	83	-	F=4.9519	Newark, 69 Worcester2 = 5.20	Alloy, cold-drawn
-		5.20	F=6.2519	Hartford = 5.204	Hi Str. low alloy, h.r.
	2.00		F=4,1019	Clayment = 3.6029	
	3.90	3.50 4.11	S=4,40 ⁶² Geneva=3,50 ¹⁶	Coatesville = 3.80 ^{2 t} Harrisburg = 3.50 ^{3 5}	PLATE Garbon steel
				Harrisburg = 4.5535	Floor plates.
			F=5.40 ¹⁹	Coatesville = 4.5031	Alley
		5.35	F=5,9519	Geneva = 5.3516	Hi Str. low alloy
4.00	3.80	3.40	SF=3.9562 LA=4.0024.62	Phoenixville=3.30 ⁵⁶ Geneva=3.40 ¹⁶	SHAPES, Structural
		5.15	F=4,0019 S=4.0562	Fontana = 5.7519 Geneva = 5.1516	Hi Str. low alloy
5.10	4.90	4.50	SF, LA=5.4524-53	Portsmouth =4.5029 Worcester =4.802	MANUFACTURER'S WIRI

Notes: †Special coated mfg ternes deduct \$1.00 from 1.50-lb coke base box price. Can-making quality blackplate, 55 to 128-lb, deduct \$1.90 from 1.50-lb coke base box. ‡Straight lengths only from producer to fabricator.

KEY TO STEEL PRODUCERS

With Principal Offices

- l Carnegie-Illinois Steel Corp., Pittsburgh
- 2 American Steel & Wire Co., Cleveland
- 3 Bethlehem Steel Co., Bethlehem
- 4 Republic Steel Corp., Cleveland
- 5 Jones & Laughlin Steel Corp., Pittsburgh
- 6 Youngstown Sheet & Tube Co., Youngstown
- 7 Armco Steel Corp., Middletown, Ohio
- 8 Inland Steel Co., Chicago
- 9 Weirton Steel Co., Weirton, W. Va.
- 10 National Tube Co., Pittsburgh
- 11 Tennessee Coal, Iron & R. R. Co., Birmingham
- 12 Great Lakes Steel Corp., Detroit
- 13 Sharon Steel Corp., Sharon, Pa.
- 14 Colorado Fuel & Iron Corp., Denver
- 15 Wheeling Steel Corp., Wheeling, W. Ya.
- 16 Geneva Steel Co., Salt Lake City
- 17 Crucible Steel Co. of America, New York
- 18 Pittsburgh Steel Co., Pittsburgh
- 19 Kaiser Co., Inc., Oakland, Calif.
- 20 Portsmouth Steel Corp., Portsmouth, Ohio
- 21 Lukens Steel Co., Coatesville, Pa.
- 22 Granite City Steel Co., Granite City, III.
- 23 Wisconsin Steel Co., South Chicago, III.
- 24 Columbia Steel Co., San Francisco
- 25 Copperweld Steel Co., Glassport, Pa. 26 Alan Wood Steel Co., Conshohocken, Pa.
- 27 Calif. Cold Rolled Steel Corp., Los Angeles
- 28 Allegheny Ludlum Steel Corp., Pittsburgh 29 Worth Steel Co., Claymont, Del.
- 30 Continental Steel Corp., Kokomo, Ind.
- 31 Rotary Electric Stee! Co., Detroit
- 32 Laclede Steel Co., St. Louis
- 33 Northwestern Steel & Wire Co., Sterling, III. 34 Keystone Steel & Wire Co., Peoria, III.
- 35 Central Iron & Steel Co., Harrisburg, Pa.
- 36 Carpenter Steel Co., Reading, Pa.
- 37 Eastern Stainless Steel Corp., Baltimore
- 38 Washington Steel Corp., Washington, Pa.
- 39 Jessop Steel Co., Washington, Pa.
- 40 Blair Strip Steel Co., New Castle, Pa.
- 41 Superior Steel Corp., Carnegie, Pa. 42 Timken Steel & Tube Div., Canton, Ohio
- 43 Babcock & Wilcox Tube Co., Beaver Falls, Pa.
- 44 Reeves Steel & Mfg. Co., Dover, Ohio
- 45 John A. Roebling's Sons Co., Trenton, N. J.
- 46 Simonds Saw & Steel Co., Fitchburg, Mass.
- 47 McLouth Steel Corp., Detroit
- 48 Cold Metal Products Co., Youngstown
- 49 Thomas Steel Co., Warren, Ohio
- 50 Wilson Steel & Wire Co., Chicago
- 51 Sweet's Steel Co., Williamsport, Pa.
- 52 Superior Drawn Steel Co., Monaca, Pa.
- 53 Tremont Nail Co., Wareham, Mass.
- 54 Firth Sterling Steel & Carbide Corp., McKees-
- 55 Ingersall Steel Div., Chicago
- 56 Phoenix Iron & Steel Co., Phoenixville, Pa.
- 57 Fitzsimmons Steel Co., Youngstown
- 58 Stanley Works, New Britain, Conn.
- 59 Universal-Cyclops Steel Corp., Bridgeville, Pa.
- 60 American Cladmetals Co., Carnegie, Pa.
- 61 Cuyahoga Steel & Wire Co., Cleveland
- 62 Bethlehem Pacific Coast Steel Corp., San Francisco
- 63 Follansbee Steel Corp., Pittsburgh
- 64 Niles Rolling Mill Co., Niles, Ohio
- 65 Atlantic Steel Co., Atlanta
- 66 Acme Steel Co., Chicago
- 67 Joslyn Mfg. & Supply Co., Chicago
- 68 Detroit Steel Corp., Detroit
- 69 Wyckoff Steel Co., Pittsburgh
- 70 Bliss & Laughlin, Inc., Harvey, III.
- 71 Columbia Steel & Shafting Co., Pittsburgh 72 Cumberland Steel Co., Cumberland, Md.
- 73 La Salle Steel Co., Chicago
- 74 Monarch Steel Co., Inc., Indianapolis
- 75 Empire Steel Co., Mansfield, Ohio
- 76 Mahoning Valley Steel Co., Niles, Ohio
- 77 Oliver Iron & Steel Co., Pittsburgh
- 78 Pittsburgh Screw & Bolt Co., Pittsburgh
- 79 Standard Forging Corp., Chicago
- 80 Driver Harris Co., Harrison, N. J.
- 81 Detroit Tube & Steel Div., Detroit
- 82 Reliance Div., Eaton Mfg. Co., Massillon, Ohio 83 Sheffield Steel Corp., Kansas City
- 84 Plymouth Steel Co., Detroit

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MERCHANT WIRE PRODUCTS

To the dealer, f.o.b. mill

	Base	Column Pittsburg Calif.
Standard & coated nails* Woven wire fencet		1259
Fence posts, carloads† Single loop bale ties	116	137
Galvanized barbed wire** Twisted barbless wire	126 126	146 146

• Pgh., Chi., Duluth; Worcester, 6 col-umns higher; Houston, 8 columns higher; Kansas City, 12 columns higher, † 15½ gage and heavier. •• On 80 rod spools, in carloads. †† Duluth, Joliet; Johnstown,

	Base per	Pittsburg,
Merch. wire, annealed:		\$6.30
Merch. wire, galv.:		6.55
Cut nails, carloads!! .	6.75	

Add 30¢ at Worcester; 20¢ at Chicago;
 10¢ at Sparrows Pt.
 ‡‡ Less 20¢ to jobbers.
 § Torrance, 126.

PRODUCING POINTS — Standard, Coated or galvanised nails, woven wire fence, bale ties, and barbed wire: Alabama City, Ala., 4; Atlanta, 65; Aliquippa, Pa. (except bale ties), 5; Bartonville, Ill. (except bale ties), 5; Fairfield, Ala., 11; Johnstown, Pa. (except bale ties), 3; Joliet, Ill., 2; Kokomo, Ind., 30; Minnequa, Colo., 14; Monessen, Pa. (except bale ties), 2; Joliet, Ill., 2; Kokomo, Ind., 30; Minnequa, Colo., 14; Monessen, Pa. (except bale ties), 2; Sparrows Point (except bale ties), 2; Sparrows Point (except bale ties), 2; Sparrows Point (except bale ties), 2; Sterling, Ill., 3; San Francisco (except nails and woven fence), 14; Torrance, Calif. (nails only), 24; Worcester (nails only), 2; Houston (except bale ties), 83; Kansas City, 83. Fence posts: Duluth, 2; Johnstown, Pa., 3; Joliet, Ill., 2; Minnequa, Colo., 14; Moline, Ill., 4; Williamsport, Pa., 51. Cut nails: Wheeling, W. Va., 15; Conshohocken, Pa., 26; Warehame, Mass., 53.

CLAD STEEL

Stainless-carbon		Plate	Sheet
No. 304, 20 pct,			
Coatesville, Pa. (21)	26.50	
Washgtn, Pa. (39).		26.50	
Claymont, Del. (29)		26.50	
Conshohocken, Pa. (*22.50
New Castle, Ind. (55) '	26.50	*24.00
Nickel-carbon			
10 pct, Coatesville (26)	27.50	
Inconel-carbon			
10 pct, Coatesville (21)	36.00	
Monel-carbon			
10 pct, Coatesville (21		29.00	
No. 302 Stainless-copp		• •	
stainless, Carnegie, Pa.		0)	75.00
Aluminized steel sheets,	not		
dip, Butler, Pa. (7)			7.75

Includes annealing and pickling, or sandblasting.

ELECTRICAL SHEETS

22 gage, HR cut lengths, f.o.b. mill

															C	·e	27	its	per lb
Armature							0			0	0	0		0					6.20
Electrical					0						ø	٠							6.70
Motor				×	*			*	8										•7.95
Dynamo	9			9		9		0						0		0	0		8.75
Transformer	7	72	2				0		0	٠	0		0	9	0			0	9.30
Transformer	•	3 5	,	0	0		۰										9		9.85
Transformer	Ę	58	3								0				e				10.55
Transformer	628	52			0	×						,				0			11.35

PRODUCING POINTS—Beech Bottom, W. Va., 18: Brackenridge, Po. PRODUCING FOINTS—Beech Bottom, W. Va., 18; Brackenridge, Pa., 28; Foilansbee, W. Va., 63; Granite City, Ill., 22*, add 0.20¢; Indiana Harbor, Ind., 8; Mansfield, Ohio, 75; Niles, Ohio, 64, 76; Vandergrift, Pa., 1; Warren, Ohio, 4; Zanesville, Ohio, 7. Numbers after producing points correspond to steel producers. See key on Steel Price page.

BOLTS, NUTS, RIVETS, SET SCREWS

Consumer Prices

(Bolts and nuts, f.o.b. mill Pittsburgh, Cleveland, Birmingham or Chicago) Base discount

Machine and Carriage Bolts

Pet	Off L	ist
	Less	
	Case	C.
1/4 in. & smaller x 6 in. & shorter	27	38
9/16 & % in. x 6 in. & shorter	29	40
% in. & larger x 6 in. shorter	26	37
All diam., longer than 6 in	22	34
Lag, all diam over 6 in. & longer	28	39
Lag, all diam x 6 in. & shorter	30	41
Plow bolts	40	_

Nuts. Cold Punched or Hot Pressed

		(Hexago	on		08		8	q	14.0	37	6)		
3/2	in. and	smaller	٠,		*	× 1							25	37
9/	16 to %	in											23	35
34	to 1 1/4 i	n. inclu	si'	V€	•			٠					23	35
1	in. and	larger											16	29

Semifinished Hexagon Nuts

(Less	Ca	8	e	10	Pe	t Off L	let.
				I	Reg	Hvy	Lt
1/2 in. and smaller					41	35	41
9/16 to % in		0	0	0	36	30	36
% to 1 % in.					31	27	33
1% in. and larger				,	21	17	
In full case lots	. 1	5		pet	add	itional	dis-
count.				-			

Stove Rolls

Sieve Boils	Pot Off List
Packaged, steel, plain finish	
Packaged, plated finish	50
Bulk, plain finish**	69.

plies.
• Zinc, Parkerized, cadmium or nickel plated finishes add 6¢ per lb net. For black oil finish, add 2¢ per lb net.

cur ye	KIVOIS	(1/2 in.	and	larger)
F.o.b.	Pittsburgh,	Cleve			100 lb
	, Birmingha				

Small Rivets

		(7	/ 1	1.6	1	72	0	a							Lis
F.o.b. Pittsburg										31	hi	c	R	E C	ō,	
Birmingham .							0		*	0	*					43
C C-4 C	 _															

Cap and Set Screws			
(In bulk)	Pe	t Off	List
Hexagon head cap screws, co	ars	e or	
fine thread, 1/4 in. thru %	in.	x 6	-
in., SAE 1020, bright	i	and	60
¼ in. through ¼ in. x 6 shorter high C heat treated			54
Milled studs			28
Flat head cap screws, listed a	izes		24
Fillister head cap, listed sizes			43
Set screws, sq head, cup poin			
diam and smaller x 6 in. and	sho	orter	59

C-R SPRING STEEL

Base per pound f.o.b. mill

0.26	to	0.40	car	bon											9	4.15
0.41	to	0.60	car	bon	0		0	,	0	۰	,	٠	0			5.95
0.61	to	0.80	car	bon												6.55
0.81	to	1.05	car	bon					ì	ì				ì		8.50
1.06	to	1.35	Car	bon						ì					Ù	10.80
		ter.				-	•		•				•			

LAKE SUPERIOR ORES

(51.50% Fe; natural content, delivered lower lake ports)

				-				Pe	7	0	ro	88 tos
Old range,	bessem	er										\$8.10
Old range,	nonbea	ssei	me	r								7.95
Mesabi, be	ssemer											7.8
Mesabi, no	nbesser	ner										7.70
High phos												
After J	n. 25.	19	50		11	nc	re	a	Be	B	0	r de
creases in												
handling c												
account.	Boo			-				-	-	-		.,

RAILS, TRACK SUPPLIES

F.o.b. mill

Standard rails, 100 lb and	heavier,
No. 1 quality, per 100 lb .	\$3.40
Joint bars, per 100 lb Light rails, per 100 lb	4.40
Light rans, per 100 lb	
	Base Price
Track spikest	5.60
Axles	5.25
Screw spikes	8.60
Tie plates	
Pittsburgh, Torr., Calif.;	
Track bolts, untreated **	8.85
Track bolts, heat treated,	to rail-
roads**	9.10

** Minnequa, deduct 35¢ † Kansas City, 5.85¢.

PRODUCING POINTS—Standard rails: Bessemer, Pa., 1; Ensley, Ala., 11; Gary, 1; Indiana Harbor, Ind., 8; Lackawanna, N. Y., 3; Minnequa, Colo., 14; Steelton, Pa., 3.

Light rails: All the above except Indiana Harbor and Steelton, plus Fairfield, Ala., 11; Johnstown, Pa., 3; Minnequa, Colo., 14.

Joint bars: Bessemer, Pa., 1; Fairfield, Ala., 11; Indiana Harbor, Ind., 8; Jollet, Ill., 1; Lackawanna, N. Y., 3; Steelton, Pa., 3; Minnequa, Colo., 14.

Track spikes: Fairfield, Ala., 11; Indiana Harbor, Ind., 6, 8; Lebanon, Pa., 3; Minnequa, Colo., 14; Pittsburgh, 5; Chicago, 4; Struthers, Ohio, 6; Youngstown, 4.

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Track bolts: Fairfield, Ala., 11; Leb-anon, Pa., 3; Minnequa, Colo., 14; Pitts-burgh, 77, 78.

Axles: Fairfield, Ala., 11; Gary, 1; Indiana Harbor, Ind., 79; Johnstown, Pa., 3; McKees Rocks, Pa., 1.

Tie plates: Fairfield, Ala., 11; Gary, 1; Indiana Harbor, Ind., 8; Lackawanna, N. Y., 3; Pittsburg, Calif., 24; Pittsburgh, 4; Seattle, 62; Steelton, Pa., 3; Torrance, Calif., 24; Minnequa, Colo., 14.

TOOL STEEL

F.o.b. mill

w	Cr	v	Mo		(Co	•		1	Base per lh
18	4	1	-		-	_				\$1.06
18	4	1	-			5			1	1.568
18	4	2	-		-	-				\$1.12
1.5	4	1.5	8			_				71.5
6	4	2	6			_				76.5
	carbon-c									57.5
	al carbo									29.5
	carbon									
	lar carbo									
Wo	rehouse	prices	00 00	a	-			4		Min

sissippi are 21/2¢ per lb higher. West of Mississippi, 4 1/2¢ higher.

COKE

Furnace, beehive (f.o.b. oven)	Net Ton
Connellsville, Pa \$14.00	to \$14.50
Foundry, beehive (f.o.b. oven)	
Connellsville, Pa \$16.00	to \$16.50
Foundry, oven coke	
	224 00
Buffalo, del'd	94.00
Chicago, f.o.b.	21.00
Detroit, f.o.b.	20.40
New England, del'd	22.70
Seaboard, N. J., f.o.b.	
Philadelphia, f.o.b.	
Philadelphia, 1.0.b.	
Swedeland, Pa., f.o.b.	
Painesville, Ohio, f.o.b.	21.90
Erie, del'd\$21.04	to 21.25
Cleveland, del'd	
Cincinnati, del'd	
St. Paul, f.o.b.	
St. Louis, del'd	21.60
Birmingham, del'd	20.20

FLUORSPAR

																	cars, net:
Effec	etiv	e Cal	F.	C	0	r	ıt	n	t			•	-				\$37.00
60%	OF	less							į.		Ĩ.	ĺ.					34.00

rice 5.60 5.25 4.20 8.85 9.10

ary, nna, ton,

In-eld, lua,

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STAINLESS STE	EF2		ь				ng poi			
Product	301	302	303	304	316	321	347	410	416	430
ingets, rerolling	12.75	13.50	15.00	14.50	22.75	18.25	20.00	11.25	13.75	11.50
Slabe, billets, rerelling	17.00	18.25	20.25	19.25	30.25	24.50	26.75	15.60	18.50	15.25
Forg. discs, die blocks, rings	30.50	30.50	33.00	32,00	49.00	36.50	41.00	24.50	25,00	25.00
Billiota, forging	24.25	24.25	28.25	25.50	39.00	29.00	32.75	19.50	20.00	20.00
Bars, wire, structurals	28.50	28,50	31.00	30,00	48.00	34.00	38.50	23.00	23.50	23.50
Piates	32.00	32.00	34.00	34.00	50.50	39.50	44.00	26.00	26.50- 27.00	26.50
Sheets	37.50	37.50	39.50	39.50	53.00	45.50	50.00	33.00	33.50	35.50
Strip, het-relied	24.25	25.75	30.00	27.75	46.00	34.50	38.75	21.25	28.00	21.75
Strip, cold-rolled	30.50	33.00	34.50	35.00	55.00	44.50	48.50	27.00	33.50	27.50

Numbers correspond to producers. See Key on Steel Price Page.

STAINLESS STEEL PRODUCING POINTS—Sheets: Midland, Pa., 17; Brackenridge, Pa., 28; Butler, Pa., 7; McKeesport, Pa., 1; Washington, Pa., 38, 39; Baltimore, 37; Midletown, Ohio, 7; Massillon, Ohio, 4; Gary, 1; Bridgeville, Pa., 59; New Castle, Ind., 55; Lockport, N. Y., 46.

Strip: Midland, Pa., 17; Cleveland, 2; Carnegie, Pa. 41; McKeesport Pa. 54; Reading, Pa., 36; Washington, Pa., 38; W. Leechburg, Pa., 28; Bridgeville, Pa., 59; Detroit, 47; Massillon, Canton, Ohio, 4; Middletown, Ohio, 7; Harrison, N. J., 80; Youngstown, 48; Lockport, N. Y., 46; New Britain, Conn., 53; Sharon, 13; Butler, Pa., 7.

Bars: Baltimore, 7; Duquesne, Pa., 1; Munhall, Pa., 1; Reading, Pa., 36; Titusville, Pa., 59; Washington, Pa., 39; McKeesport, Pa., 1, 54; Bridgeville, Pa., 59; Dunkirk, N. Y., 28; Massillon, Ohio, 4; Chicago, 1, 67; Syracuse, N. Y., 17; Watervliet, N. Y., 28; Waukegan, Ill., 2; Massillon, Ohio, 4; McKeesport, Pa., 54; Bridgeport, Conn., 44; Chicago, 67; Trenton, N. J., 46; Canton, Ohio, 4; McKeesport, Pa., 54; Bridgeport, Conn., 44; Chicago, 67; Trenton, N. J., 45; Harrison, N. J., 89; Baltimore, 7; Dunkirk, 28, Structurals: Baltimore, 7; Massillon, Ohio, 4; Chicago, 1, 67; Watervliet, N. Y., 28; Bridgeport, Conn., 44.

Plates: Brackenridge, Pa., 28; Butler, Pa., 7; Chicago, 1; Munhall, Pa., 1; Midland, Pa., 17; New Castle, Ind., 55; Lockport, N. Y., 46; Middletown, 7; Washington, Pa., 39; Cleveland, Massillon, 4.

Forged discs, die blocks, rings: Pittsburgh, 1, 17; Syracuse, 17; Ferndale, Mich., 28, Forging billets: Midland, Pa., 17; Baltimore, 7; Washington, Pa., 39; McKeesport, 54; Massillon, Canton, Ohio, 4; Watervliet, 28; Pittsburgh, Chicago, 1.

REFRACTORIES (F.o.b. works) Fire Clay Brick Carloads, Per 1000 First quality, Ill., Ky., Md., Mo., Ohio, Pa. (except Salina, Pa., add \$5) ...\$86.00 No. 1 Ohio ...\$80.00

Silica Brick Mt. Union, Pa., Ensley, Ala. \$86.00 Childs, Pa. 90.00 Hays, Pa. 91.00 Chicago District 95.00 Western, Utah and Calif. 101.00 Super Duty, Hays, Pa., Athens, Tex., Chicago 106.00 Silica cement, net ton, bulk, Eastern (except Hays, Pa.) 15.00 Silica cement, net ton, bulk, Hays, Pa. 17.00 Silica cement, net ton, bulk, Hays, Pa. 17.00 Silica cement, net ton, bulk, Ensley, Pa. 17.00 Silica cement, net ton, bulk, Ensley, Ala. 16.00 Silica cement, net ton, bulk, Chicago District 16.00 Silica cement, net ton, bulk, Utah and Calif. 22.50

Chrome B			Per Net Ton
Standard	chemically	bonded,	balt., \$69.00
Chester			\$69.00

Magnesite Brick					
Standard, Baltimore					
Chemically bonded, Baltimore	0	8		0	80.00

Grain Magnesite	
Domestic, f.o.b. Baltimor	St. %-in. grains
in bulk fines removed Domestic, f.o.b. Chewelah,	. \$56.00 to \$57.00
in bulk	

Dead	Burned Dolomite
	producing points in Pennsyl-
	ia, West Virginia and Ohio,
	net ton, bulk Midwest, add
106	; Missouri Valley, add 20¢\$12.25

METAL POWDERS

Per pound, f.o.b. shipping point, in ton lots, for minus 100 mesh. Swedish sponge iron c.i.f. New York, ocean bags... 7.4¢ to 9.0¢

Domestic sponge iron, 98+%	9.0¢ to 15.0¢
Fe, carload lots Electrolytic iron, annealed,	
99.5+% Fe	
Electrolytic iron unannealed,	01.09 60 00.09
minus 325 mesh, 99+% Fe	48.5€
Hydrogen reduced iron, mi-	
nus 300 mesh, 98+% Fe Carbonyl iron, size 5 to 10	63.0¢ to 80.0¢
Carbonyl iron, size 5 to 10	
micros, 98%, 99.8+% Fe	90.0¢ to \$1.75
Aluminum	29.00¢
Antimony	42.53#
Brass, 10 ton lots23	3.25¢ to 26.75¢
Copper, electrolytic	28.625¢
Copper, reduced	
Cadmium	\$2.40
Chromium, electrolytic, 99%	\$3.50
min.	
Lead	
Manganese Molybdenum, 99%	55.00¢
Nickel, unannealed	\$2.65 61.00¢
Nickel, spherical, minus 30	01.000
mesh, unannealed	68 004
Silicon	
Solder powder 8.5¢ pl	
Stainless steel, 302	75.00
Stainless steel, 302	86.504
Tungsten, 99%	\$2.90
Zinc, 10 ton lots1	504 to 18 254

ELECTRODES

Cents per lb. f.o.b. plant, threaded electrodes with nipples, unboxed I snoth

in in.	in in.	Per lb		
	GRAPHITE			
17, 18, 20 8 to 16 7 6 4, 5 3 2 1/2	60, 72 48, 60, 72 48, 60 48, 60 40 40 24, 30 24, 30	16.00¢ 16.50¢ 17.75¢ 19.00¢ 19.50¢ 20.50¢ 21.00¢ 23.00¢		
	CARBON			
40 35 30 24 17 to 20 14 10, 12	100, 110 65, 110 65, 84, 110 72 to 104 84, 90 60, 72 60	7.50¢ 7.50¢ 7.50¢ 7.50¢ 8.00¢ 8.25¢ 8.50¢		

PIPE AND TUBING

Base discounts, f.o.b. mills Base price, about \$200.00 per net ton

Standard, T & C

Steel, Buttweld 1/2-in. 3/4-in. 1-in. 1-in. 1-i/4-in. 1-i/4-in. 1-i/4-in. 1-i/4-in. 1-i/4-in. 2-in. 2-in. 2-in.	# Bla 40 1/2 to 43 1/2 to 46 1/2 to 46 1/2 to 47 1/2 to 48 to	38 1/4 41 1/4 44 44 1/4 45 45 1/4	24 28 31 31 ½ 32 32 ¼	Falv to 22 to 26 to 29 to 29 ½ to 30 to 30 ½ to 31
Steel, lapweld 2-in. 2 1/2 to 3-in. 3 1/2 to 6-in.	43 to	38 42 40	271/2	22 ½ 26 ½ to 24 ½
Steel, seamless 2-in. 2½ to 3-in. 3½ to 6-in.	36 39 41		20 1/2 23 1/2 25 1/2	
Wrought Iron, ½-in		1d +26 ½ +16 ½ +10 ½ + 4 ½ + 4 ½		+53 +42 +33 +291/2 +29
Wrought Iron, 2-in. 2½ to 3½-in. 4-in. 4½ to 8-in. 9 to 12-in.		+13½ +11 +6 +8 +18		+37 +321/4 +261/4 +28 +371/4

Extra Strong, Plain Ends

Steel,	bu	H	w	veld	1				
						to	3714	2414	to 22 1/4
½-in. ¾-in.							41 1/4	28 1/2	to 26 1/4
1-in					45 1/	to	43 1/2	311/2	to 29 1/2
1 1/4 -in.					46	to	44		to 30
1 1/2 -in.			0				44 1/2		to 30 1/2
2-in							45		to 32
21/4 to	3-1	n.			4734	to	45 14	331/4	to 31 1/4

2-in.	37	22 1/2
2½ to 3-in.	42	27 1/2
3½ to 6-in.	44½ to 41½ 30	to 27
Steel, seamless		

3 ½ to 6-in	l	421/2	28	
Wrought I	ron,	buttweld		
½-in		+22		+47
% -in. 1 to 2-in.		+15 1/4 + 5 1/2		$^{+40}_{+29}$

2-in. 35 2½ to 3-in. . 39

Wrought Iron,	lapweld	
2-in	+1034	+331/
21/2 to 4-in	+ 1	+22
4 1/2 to 6-in	+ 5	+2614
7 & 8-in	list	+211/
O A . S O I	1 4 4 4 /	1 00 17

7 & 8-in. ... list +21/2
9 to 12-in. ... +11 ½ +22 ½
For threads only, buttweld, lapweld and seamless pipe, one point higher discount (lower price) applies. For plain ends, buttweld, lapweld and seamless pipe 3-in. and smaller, three points higher discount (lower price) applies, while for lapweld and seamless 3½-in. and larger four points higher discount (lower price) applies. On buttweld and lapweld steel pipe, jobbers are granted a discount of 5 pct.
Fontana, Calif., deduct 11 points from figures in left columns.

BOILER TUBES

Seamless steel and electric welded com-mercial boiler tubes and locomotive tubes, minimum wall. Prices per 100 ft at mill in carload lots, cut lengths 10 to 24 ft inclu-

OD	gage	Sean	nless	Electric	Weld
in in.	BWG	H.R.	C.R.	H.R.	C.D.
2	13	\$20.61	\$24.24	\$19.99	\$23.51
2 1/4		27.71	32.58	26.88	31.60
3	12	30.82	36.27	29.90	35.18
3 1/2	11	38.52	45.38	37.36	43.99
4	10	47.82	56.25	46.39	54.56

CAST IRON WATER PIPE

6 to 24-in., del'd Chicago. \$91.80 to \$95.30 6 to 24-in. del'd N. Y. . . . 91.00 to 92.00 6 to 24-in. Birmingham . . 78.00 to 82.50 6-in. and larger, f.o.b. cars, San Francisco, Los Angeles, for all rail shipment; rail and water shipment less \$108.50 to \$113.00 Class "A" and gas pipe, \$5 extra; 4-in. pipe is \$5 a ton above 6-in.

WAREHOUSE PRICES

Base prices, f.o.b. warehouse, dollars per 100 lb. (Metropolitan area delivery, add 20¢ to base price except Birmingham, Cincinnati, Los Angeles, New Orleans (*), add 15¢; Philadelphia, add 28¢).

	SHEETS			SHEETS STRIP PLATES SHAPE			SHAPES	BA	RS	ALLOY BARS			
CITIES	Hot- Rolled	Cold- Rolled (15 gage)	Galvanized (10 gage)	Hot- Rolled	Cold- Rolled		Standard Structural	Hot- Rolled	Cold- Finished	Hot- Rolled, A 4615 As-rolled	Hot- Rolled, A 4140-50 Ann.	Cold- Drawn, A 4615 As-rolled	Celd- Draws, A 4140-80 Ann.
Baitimore	5.06	6,24- 6,44 ¹	6.48-	5,59- 5,5911		5.20- 5.6411	5.49	5.49- 5.4911	6.19	9.69	9.99	11.12	11.49
Birmingham*	5.0510	5.80	6.48 ² 6.15 ⁷	5. 1010		5.20	5.05	5.0010	6.73		****		,,,,
Boston	5.73	6.4820.	6.79-	5.78	6.90-	5.88	5.55	5.60	6.02-	9.70-	8.50-	11.15	11.45
Buffalo	5.05	6.85 5.80	7.24 ²¹ 6.80	5.41	6.95 7.27	5.45	5.18	5.05	6.58 5.75	9.97	10.37	11.05	11.35
Chicago	5.05	5.80	6.70	5.10	5.45-	5.20	5.05	5.00	5.65	9.25	9.85	10.70	11.00
Cincinnati*	5.32- 5.97	5.80- 6.24	6.29- 6.39	5.49	6.16	5.59- 5.74	5.44- 5.59	5.39- 5.54	6.10-	9.60-	9.90-	11.05-	11.35- 11.56
Cleveland	5.05	5.80	6.95	5.24	6.35	5.32	5.17	5.12	5.75	9.36	9.66	10.81	11.11
Detroit	5.33	6.08	7.09	5.49	6.27-	5.59	5.44	5.39	6.03	9.56	9.86	11.01	11.31
Houston	5.75			6.10	6.58	6.00	5,95	6.10	7.80	10.35-	10.50-	11.50	11.95
Indianapolis					7.36					10.45	10.60		12.10
Kansas City	5.65	6.40	7.30	5.70	6.95	5.80	5.65	5.60	6.35	9.85	10.15	11.30	11,60
Los Angeles*	5.80	7.00	7,452	5.85	7.35- 7.8516	5.80	5.70	5.80	7.55	10.05	10.20	11.70	12.10
Memphis	5.93	6.68		5.98	6.80	6.08	5,93	5.68	6.51	****	****		****
Milwaukee	5.19	5.94	6.84	5.24	6.32	5.34	7	5.14	5.89	9.39	9.69	10.84	11.14
New Orleans*	5.501	6.851		6.551	6.901	5.65	5,501	5.551	6.75		****		
New York	5.55-	6.54-	6.90-	5.84	6.768	5.70	5.45	5.65	6.44	9.60	9.90	11.05	11.35
Norfolk	5.65 6.10	7.00	7.00	6.30		6.15	6.20	6, 15	7.20	****	****	****	****
Omaha		***		****	****	****	****	****	****	****			****
Philadelphia*	5.30	6.20	8.70	5.65	8.29	5.45	5.25	5.50	6.31	9.35	9.65	10.80	11.10
Pittsburgh	5.05	5.80	8.70	5.20	6.00	5.20	5.05	5.00	5.75	9.25	9.55	10.70	11.00
Portland	6,60- 7,101	8 402	8 202	6 850		6,400	6 50	6.45- 6.45°	8.6014	12.0018	11.6018	****	
Salt Lake City	5.85	6.70	8.75	7.45	8.75	6.103	5.90	7.354	8.75	****	****		****
San Francisco	8.2511	7.803	7.502	6.7511	7.8516	6.1511	6.0011	6.1511	7.80	10.05	10.20	11.70	12.10
Seattle	6.704	8.152	8.202-	6.904		.354	6.254	6.354	8.5014		11.6018		13.501
St. Louis	5.38	6.13	8.35 ² 7.03	5.43	6.68- 7.54	5.53	5.38	5.33-	6.08	9.58	9.88	11.03	11.33
St. Paul	5.76	6.51	7.41	5.81	6.16- 6.82	5.91	5.76	5.35 5.71	8.42	9.96	10.26	11.41	11.71

BASE QUANTITIES: (Standard unless otherwise keyed on prices).

Hot-rolled sheets and strip, hot rolled bars and bar shapes, structural shapes, plate, galvanized sheets and cold-rolled sheets: 2000 to 9999 lb. Cold-finished bars: 1000 lb or over. Alloy bars: 1000 to 1999 lb.

All HR products may be combined to determine quantity bracket. All galvanized sheets may be combined to determine quantity bracket. CR sheets may not be combined with each other or with galv. sheets to determine quantity bracket.

Exceptions:
(1) 400 to 1499 lb; (2) 450 to 1499 lb; (3) 300 to 4999 lb; (4) 300 to 9999 lb; (5) 2000 to 5999 lb; (6) 1000 lb and over; (7) 500 to 1499 lb; (8) 400 lb and over; (9) 400 to 9999 lb; (10) 500 to 9999 lb; (11) 400 to 3999 lb; (12) 450 to 3749 lb; (13) 400 to 1999 lb; (14) 400 lb and over; (15) 1000 to 9999 lb; (16) 6000 lb and over; (17) up to 1999 lb; (18) 1000 to 4999 lb; (19) 1500 to 3499 lb; (20) CR sheets may be combined for quantity; (21) 3 to 24 bundles.

PIG IRON PRICES

Dollars per gross ton. Delivered prices do not include 3 pct tax on freight.

	PRODUC	ING POIN	T PRICES				DELIVERED	PRICES	BASE G	RADES)			
Producing Point	Basic	No. 2 Foundry	Maile- able	Besse- mer	Low Phos.	Consuming Point	Producing Point	Rail Freight Rate	Basic	No. 2 Foundry	Maile- able	Berse- mer	Low Phos
Bethlehem Birmingham Buffalo Chicago Cleveland Duluth Eris Evereit Granite City Ironton, Utah Pittsburgh Geneva, Utah Stranpwills Steelton Struthers, Ohio Swedeland Toledo Troy, N. Y. Youngstown	48.00 41.88 46.00 46.00 46.00 46.00 46.00 46.00 46.00 46.00 46.00 48.00 48.00 46.00 46.00 46.00	48.50 42.38 46.50 46.50 46.50 50.50 50.50 46.50 46.50 46.50 46.50 46.50 46.50 46.50 46.50 46.50 46.50	49,00 47,00 46,50 46,50 46,50 46,50 48,90 46,50 49,00 46,50 49,00 46,50 49,00	49.50 47.00 47.00 47.00 47.00 47.00 47.00 49.50 49.50 49.50 47.00 47.00	51.00	Boston Boston Brooklyn Cincinnati Jersey City Los Angeles Mansfeld Philadelphia Philadelphia Philadelphia Rockster San Francisco Seattle St. Louis Syracuse	Everett Steelton Bethiehem Birmingham Bethiehem Geneva-Ironton Cieveland-Tolede Bethiehem Swedeland Steelton Buffalo Geneva-Ironton Geneva-Ironton Geneva-Ironton Geneva-Ironton Geneva-Ironton Geneva-Ironton Herrichem Granite City Buffalo	2.63 7.70 3.33 2.39	48.58 53.70 49.33 50.39 50.39 44.44 48.63 53.70 53.70 48.65 49.58	50,50 50 92,79 49,08 51,13 54,20 49,83 50,89 49,94 49,13 54,20 49,15 50,08	51.00 53.29 51.63 49.83 51.39 50.44 49.63 49.65 50.58	53.79 52.13 50.33 51.89 50.94	54.33

Producing point prices are subject to switching charges; silicon differential (not to exceed 50c per ton for each 0.25 pet silicon content in excess of base grade which is 1.75 to 2.25 pet for foundry iron); phosphorus differentials, a reduction of 38c per ton for phosphorus content of 0.70 pet and over manganese differentials, a charge not to exceed 50c per ton for each 0.50 pet manganese

content in excess of 1.00 pct. \$2 per ton extra may be charged for 0.5 to 0.75 pct nickel content and \$1 per ton extra for each additional 0.25 pct nickel.

Silvery iron (blast furnace) silicon 6.01 to 6.50 pet C/L per g.t., f.o.b. Jackson, Ohio—\$57.00; f.o.b. Buffalo. \$58.25. Add \$1.00 per ton for each additional 0.50 pet \$i up to 17 pet.

Add 50c per ton for each 0.50 pct Mn over 1.00 pct. Add \$1.00 per ton for 0.75 pct or more P. Bessemer ferrosilicon prices are \$1.00 per ton above silvery iron prices of comparable analysis.

Charcoal pig iron hase price for low phosphorus \$60.00 per gross ton, f.o.b. Lyle, Tenn. Delivered Chicago, \$68.56. High phosphorus charcoal pig iron is not being produced.

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• "Insulate with Superex and you make substantial fuel savings and obtain higher operating temperatures," that's what cost-conscious operators find.

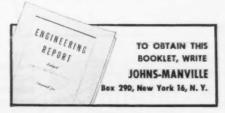
Superex provides these savings year after year. Made of calcined diatomaceous silica and asbestos, it presents a formidable heat barrier. It maintains its high insulating efficiency indefinitely on temperatures to 1900° F.... does not disintegrate ... retains its high physical strength ... resists the stresses of open hearth and other mill operations.

Higher operating temperatures with Superex result from its ability to reduce air infiltration. This advantage is traced to its unique structure and low permeability.

Superex is light in weight, easily cut and applied . . . comes in convenient standard sizes or may be ordered in irregular shapes.

To help you gain the greatest savings from Superex, Johns-Manville has prepared an engineering report, "Open Hearth Regenerators—a comparison of various insulation specifications." This report indi-

cates the economic thickness of Superex to use as related to the costs of various types of fuels. To obtain this booklet, write Johns-Manville, Box 290, New York 16, N. Y.



JOHNS-MANVILLE Jirst in INSULATIONS

For Metal Treating

USE DU PONT "NATIONAL"

minimum 99.99% YET IT COSTS NO MORE

For your protective or treating atmospheres in bright annealing, nitriding, sodium hydride descaling, brazing, normalizing and sintering-use Du Pont "National" Anhydrous Ammonia. You get pure commercial ammonia by the highest standards, at no extra cost. As for dryness, the moisture content is less than fifty parts per million. Distributors and stock points are located across the country . . . to assure you of quick delivery whether you order one cylinder or fifty.

DO YOU KNOW THESE OTHER DU PONT CHEMICALS FOR METAL TREATING?

HYDROXYACETIC ACID 70% -For bright dipping of copper, electro-polishing of stainless steel and electroless plating of nickel.

METHANOL - Source of hydrogen and carbon monoxide as a treating atmosphere, and for cleaning of metal parts during fabrication.



. THROUGH CHEMISTRY

Product sheets on these and other chemicals are available. Please write on your letterhead to: E. I. du Pont de Nemours & Co. (Inc.), Polychemicals Department, Wilmington 98, Delaware.

POLYCHEMICALS DEPARTMENT

350 Fifth Avenue, New York 1, N. Y. 7 S. Dearborn Street, Chicago 3, III. 818 Olive Street, St. Leuis 1, Misse

Continued

FERROALLOYS

F			
rer	roman	gane	se .

78-82% Mn. maximum contract price, gross ton, lump size.	base
F.o.b. Birmingham F.o.b. Niagara Falls, Alloy, W. Va.,	\$174
Welland, Ont. F.o.b. Johnstown, Pa.	\$179
F.o.b. Sheridan, Pa. F.o.b. Etna, Clairton, Pa.	\$179
\$2.00 for each 1% above 82% penalty, \$2.15 for each 1% below	Mn
Briquets—Cents per pound of bridelivered, 66% contained Mn.	quet,
Carload, bulk	10.45
Ton lots	12.05

Spiegeleisen

Contract prices gross ton, lump, f.o.b.

16-19% Mn
19-21% Mn
3% max. Si
almerton, Pa.
gh. or Chicago
65.00

16-19% Mn
3% max. Si
3% max. Si
66.00 Palmerton, Pa. Pgh. or Chicago

Manganese Metal

Electrolytic Manganese

F.east	of N															lo	Wed
Carlo	pads																21
Ton	lots																30
Less	ton	1	0	te	3												31

Medium Carbon Manganese

Low-Carbon Manganese

Contract price, cents per pound Mn contained, lump size, delivered.

							arloads	Ton	Less
0.07% max. C.		0.	.0	16	1	16			
P. 90% Mn							25.25	27.10	28.20
0.10% max. C							24.75	26.60	27.80
							24.25	26.10	27.30
0.30% max. C							23.75	25,60	26.80
0.50% max. C							23.25	25.10	26.30
9.75% max. C.									
7 0000 max 6	31						90 95	99 10	98 80

Silicomanganese

Contract basis, lump size, cents per pound of metal, delivered, 65-68% Mn, 18-20% Sl, 1.5% max. C. For 2% max. C, deduct 0.2¢. Carload bulk Carload bulk 8.95
Ton lots 10.60
Briquet, contract basis carlots, bulk delivered, per ib of briquet 10.30
Ton lots 11.90

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Lams

Silvery Iron (electric furnace)
Si 14.01 to 14.50 pct, f.o.b. Keokuk, Iowa, or Wenatchee, Wash., \$77.00 gross ton, freight allowed to normal trade area; Si 15.01 to 15.50 pct, f.o.b. Niagara Falls, N. Y., \$73.50. Add \$1.00 per ton for each additional 0.50% Si up to and including 18%. Add \$1.00 for each 0.50% Mn over 1%.

Silicon Metal

Contract price, cents per pound contained Si, lump size, delivered, for ton lots

Silicon Briquets

Electric Ferrosilicon

Contract price, cents per pound contained Si, lump, bulk, carloads, delivered. 25% Si 17.00 75% Si 13.50 50% Si 11.30 85% Si 14.65 90-95% Si 16.50

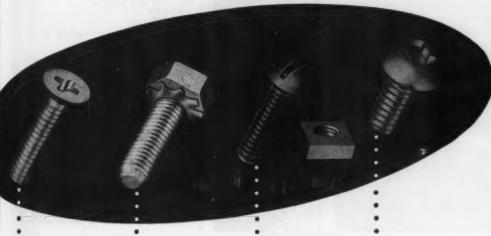
Calcium Metal

Eastern zone contract prices, cents per pound of metal, delivered.

Cast Turnings Distilled
Ton lots \$2.05 \$2.95 \$7.75
Less ton lots. 2.40 3.30 4.55



FOR LIGHT-METAL FASTENING



PHILLIPS HEAD SCREWS

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with the famous patented recess that centers the driver automatically. Powerdrivers may beused at high speeds without danger of slipping. With-stands high torque pres-sures because strain on acrew is exerted deep in the head.

SEMS

are pre-assembled lock-washer screws that speed assembly operations by eliminating an extra operation and time-wasting fumbling. Washers rotate but cannot come off. Available with many different types of washers and heads.

SLOTTED HEAD MACHINE SCREWS

and nuts. The "old reli-able", in its finest form! Lamson machine screw heads are uniformly concentric, slotted deeply and accurately. A wide range of sizes available.

CLUTCH HEAD SCREWS

Z

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AL

require little end-pres-sure on the driver. No "back-out" tendency! Driver bit sticks in screw recess when bit is turned to left - releases when screw is tightened down.

teners in STEEL.

, BRONZE and ALUMINUM

• Inefficiency on assembly lines can often be traced to fastener troubles. Therefore it's important that fasteners be selected to do the job with a minimum of waste motion, fumbling and product damage.

Lamson & Sessions makes a wide selection of fasteners especially engineered to perform hundreds of assembly jobs faster and therefore, at less cost.

If you suspect that fastener inefficiency is slowing up your assembly line, tell us your problem and chances are we can suggest a remedy.

LAMSON & SESSIONS Co.

General Offices: 1971 West 85th Street, Cleveland 2, Ohio Plants at Cleveland and Kent, Ohio . Birmingham . Chicago

MAKERS



FASTENERS SINCE 1866





NUTS . SCREWS . COTTERS . STUDS . RIVETS . SPECIALS . SCREW MACHINE PRODUCTS







COTTER PINS: Steel, Brass, Aluminum and Stainless Steel.



SPECIAL NUTS: Cone, Barrel, Oblong, Plier, Tri-Slot, Halfround, etc.



PHILLIPS AND CLUTCH HEAD: Machine Screws and Tapping Screws.



MILLED STUDS: Concentric, accurate, in a full range of sizes.



"BENT" BOLTS: Including U Bolts, Eye Bolts, Hook Bolts, etc.



WEATHER-TIGHT BOLTS: Eliminate counter-boring in wood assemblies.



PIPE PLUGS: Forged Steel, heat-treated.

FOR MORE INFORMATION ON LAMSON Money-Saver FASTENERS CHECK **COUPON and CLIP THIS STRIP**

The Lamson & Sessions Company 1971 W. 85th St., Cleveland 2, Ohio

Power Plus-

for lifting and transporting full capacity loads



every handling job is easier with TOWMOTOR MH!

With engines especially geared for heavyduty industrial use, with plenty of power and speed to spare—even for the heaviest loads—Towmotor cuts 20% to 30% from your production costs. Compare Towmotor with any other fork lift truck and you will see why Towmotor's sturdy features make every Mass Handling job easier, faster, safer. 12 models plus standard and specially designed accessories handle loads from 1500 to 15,000 lbs. —a Towmotor for every job. Write for a copy of "Handling Materials Illustrated." Towmotor Corporation, Division 15, 1226 E. 152nd St., Cleveland 10, Ohio. Representatives in all Principal Cities in U. S. and Canada.



Clutch engagements reach 500 an hour in especially heavy service, producing high temperatures in clutch and flywheel assemblies. So Towmotor clutches are extra large, fully ventilated ... to provide for quick dissipation of heat!

Ask to see the Towmotor movie, "The One Man Gang," right in your office.



FORK LIFT TRUCKS and TRACTORS

RECEIVING . PROCESSING . STORAGE . DISTRIBUTION

TRON AGE FOUNDED 1855 MARKETS & PRICES Continued

Ferrochrome

	Con tained delive	cr,	1111	mp i	Blze	. Du	IK.	- 1	n	1	CA	1.70	hen
	0.06%	C		28.7	5	0.20	96	C					97 1
	0.10% 0.15%	C		28.2	5	1.00	%	C		• •			27.5
1	2.00%	C											27 (
	65-699 62-669	6 Cr.	4-3	6% (C, 6	-9%	Si		0				20.5

High-Nitrogen Ferrochrome

Low-carbon type: 67-72% Cr. 0.75% N. Add 5¢ per lb to regular low carbon ferrochrome price schedule. Add 5¢ for each additional 0.25% N.

S. M. Ferrochrome

Contract p mium contain High carbo Si, 4-6% Mn,	ec	1,	lu	IN	nj	9	B	X	0,	d	le	1	h	re	r	6	d.	
Ton lots Less ton lots Low carbon			/P	e		6	2	6	6									23.75
4-6% Mn, 1.2 Carloads Ton lots Less ton lots											0	0		6	0			30.05

Chromium Metal

Contract tained pack min. Cr. 1%	ced			đ	e	11	V	e	r	0	d			ti	01	מ	10	n	i	ti	m L	97%
0.20% max.	C					0													0	0	0	\$1.09
0.50% max.	C							0		0	0	0	0		4	4					2	1.05
9.00 min. C		*	×	*		×	*		×			•		×					*		*	1.04

Low Carbon Ferrochrome Silicon

(Cr 34-41%, Si 42-49%, C 0.05% max) Contract price, carloads, f.o.b. Niagar Falls, freight allowed; lump 4-in. x down, bulk 2-in. x down, 20.50¢ per lb of contained Cr plus 11.30¢ per lb of contained Cr plus 11.30¢ per lb contained Si Bulk 1-in. x down, 20.65¢ per lb contained Cr plus 11.50¢ per lb contained Si

Calcium-Silicon

Contract delivered.	t		P	T	i	De	9		p	e	r		1	b	0	f		8	ıl	10	0	y,	,	lump,
30-33%																								
Carloads							۰	0									٠							17.30
Ton lots .												*												21.00
Less ton l	0	tı	1			*		*																22.50

Calcium-Manganese-Silicon

Contra lump, de								d	,	-	C	e	n	tı	3	1	p	81	•	1	lt)	-	ol		alloy
16-20%	,	('n	L,		1	4	-	1.1	30	×	,	h	1	n	9	5	3		5	9	9	6	-	31,	
Carloads			0	0				0	٥	0				0	0	4			0	0		0				19.2
Ton lots	:			×	á					×								*					٠	*	*	21.5
Less ton	10	0	LE	3			0				*		*				٠			0					6	32.00

CMSZ

Contract loy, deliver	price,	cents	per	pound	of al-
Alloy 4: Si. 1.25-1.75	45-49	% Cr,	4-69	Mn,	18-21%
Alloy 5: 16.00% Si,	50.56	% Cr.	4-64	Mn,	13.50-
Ton lots					. 13.72
Less ton lot					21.00

V Foundry Alloy

Cents																						
sion Brie St. Loui	8.	v.	5	 3	is	3.	4	2	9	g	n	t	1	n.	11	1	7	7-	1	9%	134	Si
8-11% M Ton lots															*					15		
Less ton	lots																			17	.0	0

Graphidox No. 4

Cents pension max. St.	Bridge	e. N.	Y	fr	rei	g	ht	all	OWE
Ca 5 to Carload 1 Ton lots	to ca	riona	DRC	Ked	١.			. 1	1.8.44
Less ton	lots .							 . 1	13.50

SMZ

Contra	ct	pr 0-	6	Ce 5	9,	.6	C	er	at i,	8	5.	7	9	6	p	O	u	n,	d	1	0	27	allog
20% Fe,	1/2	1 T	١.	X	8	1	2		m	18	8	h											
Ton lots Less ton	lot	B																					18.8



COATED PRODUCTS COMMENTS



Belt grinding production doubled, unit cost cut

Production increases of as much as 30-50-100% and more are not uncommon when CARBORUNDUM's Industrial Cloth Belts are used to grind either high or low tensile strength metals. There's the shovel manufacturer who increased the number of shovel handles per belt from 960 to 1260 units. Or take the plant that is polishing stainless steel tubing at ½½ per foot now where 7¢ per foot was the former cost, by another machine. These cases are representative of hundreds of others where CARBORUNDUM's cloth

belts are credited with increased production and lower unit cost.

The reasons behind this belt performance are the long grinding service of sharp cutting ALOXITE aluminum oxide grain and the stretch resistant, heavy duty cloth backing treated to withstand the most severe operations. Add to this the heat resistant bond and you have an abrasive belt combination that is hard to match. Coated Products Division, The Carborundum Company, Niagara Falls, New York.

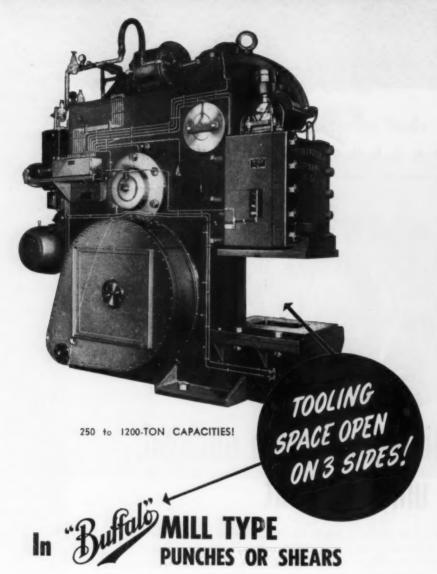
COATED ABRASIVES BY

CARBORUNDUM

TRADE MARK

Making All abrasive products...to give you the proper ONE

"Carborundum" and "Aloxite" are registered trademarks which indicate manufacture by The Carborundum Company



- FASTER PUNCHING, SHEARING, BLANK-ING!
- EXTRA LARGE CAPACITIES!
- LONGER POWER STROKES, UP TO 6"!
- FASTER POWER STROKES, UP TO 35 PER MINUTE!
- RIGID ELECTRICALLY WELDED STEEL PLATE FRAME!

BUFFALO FORGE COMPANY
492 BROADWAY BUFFALO, N. Y.

Canadian Blower & Forge Co., Ltd., Kitchener, Ont.

Write for Bulletin 3650

Continued Other Ferrodicys

Alsifer, 20% Al, 40% Si, 40% Fe, contract basis, f.o.b. Suspension Bridge, N. Y.
Carload

Ton lots
Calcium molybdate, 45-40%, f.o.b.
Langeloth, Pa., per pound contained Mo
Ferrocolumbium, 50-60%, 2 in. x D, contract basis, delivered, per pound contained Cb.

Ton lots
Less ton lots
Ferro-Tantalum-columbium, 20%
Ta, 40% Cb, 0.30 C. Contract basis, delivered, ton lots, 2 in. x D, per lb of contained Cb plus Ta
Ferromolybdenum, 55-75%, f.o.b.
Langeloth, Pa., per pound contained Mo
Ferrophosphorus, electrolytic, 23-26%, carlots, f.o.b. Siglo, Mt.
Pleasant, Tenn., \$3 unitage, per gross ton
10 tons to less cripad
Ferrotitanium, 40%, egular grade, 0.10% C max, f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti
Ferrotitanium, 25%, low carbon, 0.10% C max, f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti
Less ton lots
Ferrotitanium, 15 to 19%, high carbon, f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, carloads per net ton

**Ferrotitanium, 15 to 19%, high carbon, f.o.b. Niagara Falls, N. Y., freight allowed, carloads per net ton

**Errotungsten, standard, lump or

**Y x down, backed, per pound Other Ferroalloys 7.654 960 \$3.50 \$2.67 \$1.13 \$65.00 75.00 \$1.28 \$1.40 1.45 bon, f.o.b. Niagara Falls, N. Y., freight allowed, carloads per net ton
Yerrotungsten, standard, lump or
Yex down, packed, per pound contained W. 5 ton lots, delivered
Ferrovanadium, 35-55%, contract basis, delivered, per pound, contained V.
Openhearth
Crucible
High speed steel (Primos)
Molybdic oxide, briquets or cans, per lb contained Mo, f.o.b. Langeloth, Pa.
bags, f.o.b. Washington, Pa.,
Langeloth, Pa.
Simanal, 20% Si, 20% Mn, 20%
Al, contract basis, f.o.b. Philo,
Ohio, freight allowed, per pound
Carload, bulk, lump
Ton lots, bulk, lump
Less ton lots, lump
VsOs contract basis, per pound
contained VsOs.
Zirconium, 35-40%, contract basis, f.o.b. plant, freight allowed, per pound of alloy.
Ton lots
Zirconium, 12-15%, contract basis, lump, delivered, per lb of alloy.
Carload, bulk \$160.00 \$2.25 \$2.90 3.00 3.10 954 944 \$1.20 21.004 6.604 Boron Agents Silcaz, contract basis, delivered.
Ton lots Resume Your Reading on Page 171

FOUNDED 1855 MARKETS & PRICES

Mo

UDYLITE PLATING EQUIPMENT KEEPS PRODUCTION



A YEAR AGO the Darnell Corporation Ltd., Long Beach, California, faced a bottleneck in their plating department. Barrels of steel parts were stacked up, waiting to be plated. Since installing a Udylite Junior Full Automatic, they are able to keep up with production by operating the machine only part time. In addition, parts are now thoroughly cleaned, pickled and, after plating, given a dichromate dip to improve paint adhesion.

Like many other platers they have found their Udylite equipment and plating processes improve both the quality and the quantity of production and reduce direct labor costs.

Udylite offers a complete line of plating and metal finishing equipment for all plants. Trained engineers are available at all times for consultation with you concerning your plating problems. Call in your Udylite Technical Man today. No obligation.



PIONEER OF A BETTER WAY IN PLATING

Representatives in Principal Cities

ES

960

3.50

2.67

5.00

1.28

0.00

2.25

2.90 3.00 3.10

956

94¢

1.26

604

1.25

45¢

ax. in. .20

.75

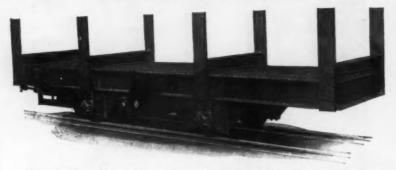
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GE

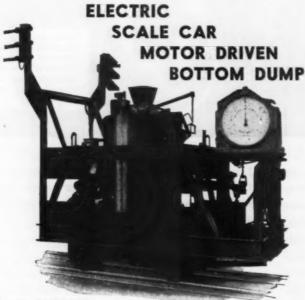
ATLAS

EQUIPMENT SPEEDS PRODUCTION

10 TON STORAGE BATTERY FLAT CAR



Built for handling pipe and conduit. Powered by storage battery. Geared to travel at walking speed when controller is held in operating position. Automatic "shut-off" and brake applied when spring return handle of the controller is released.



36 CU. FT. CAPACITY

For use in chemical plants. Cylindrical type body with dust filter. Mounted on Atlas Scale with 24" Atlas Dial and type-printing recorder. Car equipped with brakes, levers for operating discharge and loading chutes.

ATLAS ENGINEERING SERVICE IS ALWAYS AT YOUR SERVICE



THE ATLAS CAR & MFG. CO.

Dates to Remember



Apr. 3-4—Assn. of Iron & Steel Engineers, spring conference, Birmingham. Association headquarters are at 1010 Empire Bidg., Pittsburgh.

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Apr. 4—Society for Applied Spectroscopy, meeting, Socony-Vacuum Training Center, New York. Society secretary is Ruth Abbott, American Cyanamid Co., Bound Brook, N. J.

Apr. 4-7—National Assn. of Corrosion Engineers, annual conference, Hotel Jefferson, St. Louis. Association headquarters are in Milam-Bidg., Houston.

Apr. 5-7-Midwest Power Conference, Sherman Hotel, Chicago. Conference director is Roland A. Budenholzer, Illinois Institute of Technology, 3300 S. Federal St., Chicago.

Apr. 10-12—American Institute of Mining & Metallurgical Engineers, annual openhearth, blast furnace, coke oven and raw materials conference, Netherland Plaza Hotel, Cincinnati. AIME headquarters are at 29 W. 39th St., New York.

Apr. 10-12—American Society of Lubrication Engineers, annual convention, Hotel Statler, Detroit. Society headquarters are at 343 S. Dearborn St., Chicago.

Apr. 10-14—American Society of Tool Engineers, industrial cost-cutting exposition, Philadelphia Convention Hall, Philadelphia. Society headquarters are at 10700 Puritan Ave., Detroit.

Apr. 11-12—American Zinc Institute, annual meeting, Hotel Statler, St. Louis. Institute headquarters are at 60 E. 42nd St., New York.

Apr. 12-14—American Society of Mechanical Engineers, spring meeting, Hotel Statler, Washington. Society headquarters are at 29 W. 39th St., New York.

Apr. 13-14—American Machine Tool Distributors Assn., spring meeting, Edgewater Beach Hotel, Chicago. Association secretary is Thos. A. Fernley, Jr., 505 Arch St., Philadelphia.

Apr. 25-26—Metal Powder Assn., annual metal powder show, Book-Cadillac Hotel, Detroit. Association headquarters are at 420 Lexington Ave., New York.

Apr. 27-28—American Steel Warehouse Assn., annual meeting, Shamrock Hotel, Houston. Association headquarters are at 442 Terminal Tower, Cleveland.

May 4-5—National Machine Tool Builders' Assn., spring meeting, Edgewater Beach Hotel, Chicago. Association headquarters are at 10525 Carnegle Ave., Cleve-

May 8-12—American Foundrymen's Society, annual convention and exhibition, Public Auditorium, Cleveland. Society headquarters are at 222 W. Adams St., Chicago.

May 22-24—American Supply & Machinery Manufacturers' Assn., industrial supply convention, Convention Hall, Atlantic City, N. J. Association headquarters are at 1108 Clark Bldg., Pittsburgh.

Oct. 23-27—National Metal Congress & Exposition, International Amphitheater, Chicago. American Society for Metals headquarters are at 7301 Euclid Ave., Cleveland.



PUBLICATIONS

Continued from Page 36

a number of advantages. Orange Roller Bearing Co. For more information, check No. 12 on the postcard on p. 37.

Power Tools

The heavier line of Walker-Turner power tools for wood, metal and plastic are described in a 36-p. illustrated catalog. Walker-Turner Div., Kearney & Trecker Corp. For more information, check No. 13 on the postcard on p. 37.

Strainer Cores

The line of Harbison-Walker high strength, erosion-resistant refractory strainer core shapes are described in a new 4-p. folder. Harbison-Walker Refractories Co. For more information, check No. 14 on the postcard on p. 37.

Surface Grinder

A new 4-p. bulletin pertains to the No. 24 Duplex rotary surface grinder equipped with two rotary tables and magnetic chucks. Mattison Machine Works. For more information, check No. 15 on the postcard on p. 37.

End Mills

National Helex short series fast spiral end mills are described in an 8-p. pamphlet listing prices for stock sizes. National Twist Drill & Tool Co. For more information, check No. 16 on the postcard on p. 37.

Grinding Machine

The new No. 10N cutter and tool grinding machine is presented in a 22-p. catalog, also showing additional equipment and accessories. Brown & Sharpe Mfg. Co. For more information, check No. 17 on the postcard on p. 37.

Ornamental Grilles

Ornamental grille patterns, both classic and modern, as well as special grilles, fixed or movable lou-



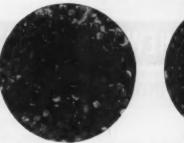
You cannot afford to turn your back on these facts: The payoff comes from the results



The payoff comes from the results you get. The new 20th Century Drawn Steel Peening and Blast Cleaning Shot is more efficient because the pellet size is made absolutely uniform to start with, and the mass remains uniform hundreds of passes longer than with ordinary abrasives.

20th Century Drawn Steel Shot is more economical because it outlasts conventional hard iron shot 8 to 1, and cast steel shot at least 2 to 1, thereby reducing abrasive purchases and freight and freight handling cost.

--- for PEENING and BLAST CLEANING



The Original Form.



After 98 Passes.

20th Century Drawn Steel Shot is dependable. Made by one of the older and reliable abrasive manufacturers.

A trial is convincing. Send your first order today. There is a size for every need.

THE CLEVELAND METAL ABRASIVE CO.

Main Office and Plant: 880 East 67th Street, Cleveland 8, Ohio Howell Works-Howell, Michigan



... for the RIGHT hose for every need!

When you buy Hewitt-Robins industrial rubber hose, wrapped inside every cover is almost a century of hose-making experience. You don't pay extra for it . . . it pays off in longer, more efficient service on the job.

Hewitt-Robins research chemists know that no one type of hose can meet all the problems of industry. That's why they use natural and synthetic rubber, cotton, rayon, nylon, glass, chemicals by the score—in whatever raw material combination is best for each service requirement. Testing engineers torture hose at the plant... give it months of wear and tear in a few days. Field engineers the country over help users get the longest service at the lowest cost.

All of which means that the Hewitt-Robins name on a hose means it's right for its particular job.

Typical examples of Hewitt-

Robins specially engineered rubber hose are:

Acetylene • Acid • Air • Alcohol • Barge Loading • Butane-Propane • Cement Placement • Fire • Flexible Rubber Pipe • Foam • Fuel Oil • Hydraulic • Mill • Oil Industry • Pneumatic Tool • Rotary Drilling • Sand Blast • Steam • Suction • Vacuum, Industrial • Water • Welding (Twin-Weld®)

Whatever your hose needs, it will pay you to put the problem up to hose headquarters. Call your Hewitt Rubber distributor (see classified phone book—"Rubber Products" listing) or write Hewitt Rubber Division, 240 Kensington Avenue, Buffalo 5, N. Y.

HEWITT-ROBINS

INDUSTRIAL HOSE

- HEWITT-ROBINS



INCORPORATED .

BELT CONVEYORS (belting and machinery)

CAR SHAKEOUTS

DEWATERIZERS

FOUNDRY SHAKEOUTS

INDUSTRIAL HOSE

MINE CONVEYORS

MOLDED RUBBER GOODS

RUBBERLOKT ROTARY WIRE BRUSHES

VIBRATING CONVEYORS, FEEDERS AND SCREENS

FREE PUBLICATIONS

Continued

vres, and special panels and enclosures are shown in a new 48-p. illustrated catalog. Harrington & King Perforating Co. For more information, check No. 18 on the postcard on p. 37.

Aluminum Stud Welds

Technical information describing aluminum stud welding, its advantages, applications and acceptance is contained in a new 4-p. brochure. Shielded Stud Welding Co. For more information, check No. 19 on the postcard on p. 37.

Milling Machines

Cincinnati No. 3MI milling machines, plain and universal, are presented in a 12-p. catalog listing highlights of design and specifications, and showing dimensional drawings. Cincinnati Milling Machine Co. For more information, check No. 20 on the postcard on p. 37.

Trolley Conveyers

Book No. 2330 shows how overhead conveyers have solved many problems economically in different types of plants, and describes Link-Belt conveyers. Link-Belt Co. For more information, check No. 21 on the postcard on p. 37.

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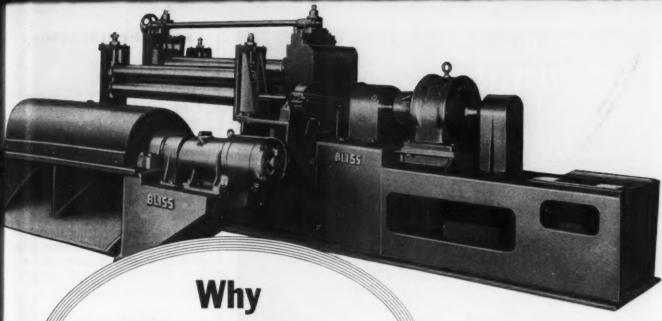
The Diamond Utiliscope, wired television for industry, research, commerce, education and science is described in a new 16-p. bulletin. Diamond Power Specialty Corp. For more information, check No. 22 on the postcard on p. 37.

Steel Strapping

How to apply Acme steel strapping for bracing railway car doorways is shown in a 4-p. folder. Acme Steel Co. For more information, check No. 23 on the postcard on p. 37.

Die Springs

High pressure medium deflection, and medium pressure high deflection die springs, and Danly



Why
Bliss Slitters
are cost-cutters,
too!

One of many models of Bliss Slitters with scrap chopper which handle coil and sheet up to 48" wide and .135 gauge.

Add up these savings in both time and money with Bliss slitting equipment:

- Lower initial cost of stock. You can buy sheets or coils in "least common denominator" widths—at considerable price savings.
- 2. No production delays waiting for unusual or hard-toget stock widths.
- 3. Eliminate stock waste. If your specifications change, you'll have no useless inventory to dispose of. You cut metal to your needs—as you need it.
- 4. Easy storage and handling. No extra facilities needed to keep a variety of widths on hand.

Unusual service requirements are easily met by setting up Bliss Slitters either for a sheet or coil-operating line. Complete arbors with spacers and cutting knives can be removed easily for interchangeability, knife dressing, and alignment. Complete changeover takes *only* 15 minutes.

Bliss Slitters are rugged in design, accurate and reliable in operation and simple to maintain. They are adaptable to any type of continuous or semi-continuous operation on various metals in a wide range of widths and gauges. For added profits and ease in handling, a Bliss Scrap Chopper can be teamed up in a natural combination with the slitter.

Let Bliss help you "hold the line" on manufacturing costs. In slitters, as in rolling mills and power presses, it pays to put your problem up to Bliss.



End view of slitter arbor housing. Complete arbor can be removed and changeover made in 15 minutes.



Scrap chopper used with slitter to chop trimmed stock for easy and profitable handling.

E. W. Bliss Company

General Office: Toledo 7, Ohio

Rolling Mill Division

Salem, Ohio

Rolling Mills, Mechanical and Hydraulic Presses, Container Machinery

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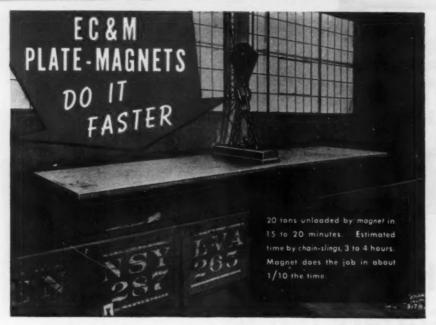
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SAVE UP TO 90%

IN UNLOADING TIME

Here's a plant that uses several EC&M Plate-Magnets in the loading, unloading, stacking and processing of their plates, sheets, bars, pipe, etc. On long pieces, they use two magnets on a spreader-bar.

These EC&M Magnets not only reduce operating costs but they speed up handling. Railroad cars or trucks are loaded or unloaded without delay and handling throughout the plant is fast. There's no prying to affix chains and no danger of pinching hands when securing chains.

Send us the complete facts of your handling needs, so that we may write fully when sending Bulletin 903 describing EC&M Plate-Magnets.



FREE PUBLICATIONS

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precision dowel pins are shown in a 4-p. price list. Danly Machine Specialties, Inc. For more information, check No. 24 on the postcard on p. 37.

Aluminum Paint

Painting with aluminum is the subject of a new 32-p. brochure showing proven applications and an aluminum paint coverage table. Aluminum Co. of America. For more information, check No. 25 on the postcard on p. 37.

Free-Cutting Steel

Revised edition of the original booklet on E-Steel gives a complete description of the new free-machining Bessemer screw stock, and adds additional results of field tests. Jones & Laughlin Steel Corp. For more information, check No. 26 on the postcard on p. 37.

Corrosion Resistance

The complete story of four Hastelloy high strength, nickel-base, corrosion-resistant alloys is told in a new 40-p. booklet. Haynes Stellite Div., Union Carbide and Carbon Corp. For more information, check No. 27 on the postcard on p. 37.

Reverberatory Furnaces

Stroman Economelt reverberatory furnaces for melting gray iron or a number of nonferrous metals and alloys are described in an 8-p. bulletin. Stroman Furnace & Engineering Co. For more information, check No. 28 on the postcard on p. 37.

Combination Punch

Construction features of several models of the Kling combination shear, punch and coper are described in a 12-p. folder giving punch jaw dimensions, punch, die and shear blade attachment data, and shearing blade replacement data. Kling Bros. Engineering Works. For more information, check No. C1 on the postcard on p. 37.

Resume Your Reading on Page 37



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IMPORTANT ADVANTAGES IN FOOTE BROS.

NEW HYGRADE DRIVES

STURDY CONSTRUCTION

Gearing, shafts, bearings designed for heavy duty applications. Rigid housings maintain accurate alignment.

2 HIGHEST QUALITY FOR LONG LIFE

All materials are of highest quality. Simple gear assemblies—small number of working parts—large antifriction bearings all contribute to long life.

3 COMPACT DESIGN

Advanced design assures compact spacesaving units in keeping with ratio of reduction, mechanical and thermal capacities required.

4 BETTER GEARS

New developments in manufacturing result in precision generated worm gear teeth which assure higher efficiency and greater load-carrying capacity. Worms are integral with worm shafts. Helical gears and pinions are shaved for full tooth contact.

GREATER DEPENDABILITY

Advanced engineering, improved design, plus accurate control of finest materials, modern heat-treatment, and manufacture—all assure higher quality, greater dependability.

SMOOTH PERFORMANCE—

Precision manufacture results in uniform tooth action giving smooth, quiet transfer of torque.

7 TROUBLE-FREE OPERATION

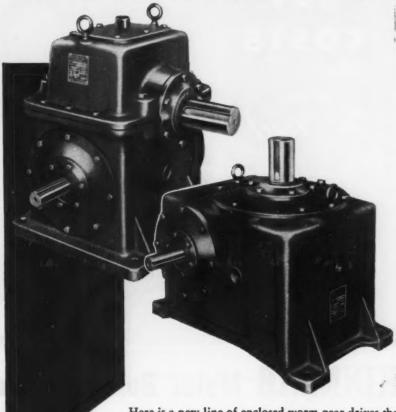
Totally enclosed oil-tight and dustproof housings—ample lubrication for all moving parts. Maintenance is held to a minimum.

8 WIDE RANGE OF TYPES— SIZES—RATIOS

Hygrade Reducers are available in horizontal, vertical and Hytop types. Hytop vertical design permits long, unsupported shaft extensions. Ratios 41/8: 1 up to 4108: 1 (higher where required.)

9 STANDARD RATIOS —PROMPT DELIVERY

To assure prompt delivery, standard stock ratios have been developed. These are available on short notice.



Here is a new line of enclosed worm gear drives that offers a wide range of sizes and ratios in horizontal, vertical and Hytop (long unsupported vertical shaft extension) types.

Newly designed cases assure greater compactness combined with rigid construction. New manufacturing processes result in precision generated worm gears giving high efficiency and load carrying capacity.

An engineering manual, HGA, gives complete rating and dimension tables, engineering data, etc. Mail the coupon for your copy.

FOOTE BROS.

Better Power Translission Through Better Gears



FOOT BROS.-LOUIS ALLIS



MAXI-POWER HELICAL GEAR DRIVES

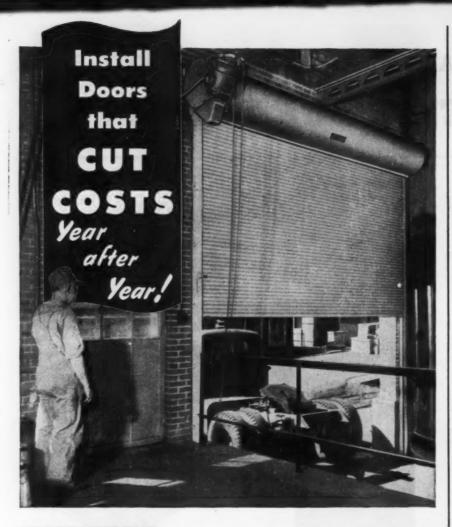


HY-POWER WORM GEAR DRIVES

Foote Bros. Gear and
Machine Corporation
Dept. M, 4545 S. Western Blvd. Chicago 9, Illinois
Please send me a copy of Engineer Manual HGA.



Name	
Company	
Position	
Address	*********
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KINNEAR Metal Rolling Doors

Reducing door costs is not the only gain you make when you install Kinnear Rolling Doors. You also help cut other plant costs, in many ways.

Coiling upward action permits full use of all floor and wall space around openings, at all times. You can stack materials within an inch or two of the door, inside or outside—or on both sides—without impeding its action. This promotes more efficient handling of door traffic, deliveries, and shipments.

The smooth, easy action of Kinnear Rolling Doors saves time and labor—and no other type of door is so well adapted to the extra advantages of motor operation. With pushbutton

controls at any desired number of convenient points, the door can be raised or lowered quickly at a second's notice.

As a result, they are consistently closed more quickly after being opened, which brings important reductions in heating and air-conditioning costs.

When opened, the doors remain completely out of the way, safe from damage by wind or vehicles. When closed, their rugged all-metal interlocking-slat curtain assures extra protection against fire, intrusion, wind and weather.

Kinnear Rolling Doors are built in any size, to meet the particular specifications of each opening, in old or new buildings. Motor or manual control. Write for full information.

With this rugged Kinnear Motor Operator, doors can be opened or closed from any number of convenient push-button controls.



KINNEAR
ROLLING DOORS

Offices and Agents in All Principal Cities

THE KINNEAR MANUFACTURING CO.
Factories: 1760-80 Fields Ave., Columbus 16, Ohio
1742 Yosemite Ave., San Francisco 24, California

NEW

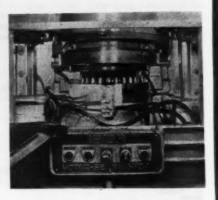
PRODUCTION IDEAS

Continued from Page 40

and 5% in. Motor and wheels can be set at any position 20° either side of vertical center. Wickman Mfg. Co. For more information, check No. 40 on the postcard on p. 37.

Gear Cutting Machines

Development of Shear-Speed gear cutting machines that handle cutting of internal gears and splines up to 20 in. diam, have made it possible to cut gears at practically identical production rates to those required for finishing the same



gears by the fast underpass method. The average machine cycle time is less than a minute per gear and may run as low as a few seconds. Michigan Tool Co. For more information, check No. 41 on the postcard on p. 37.

Gages

The Nilco dial snap gage features a framework machined from rolled magnesium with angles at 45° to provide maximum rigidity and to minimize dimensional changes caused by variations in temperature fluctuations. A vernier type adjusting screw permits ¼ in. adjustments of the gaging pin or movable anvil. The adjustment can be locked with the gaging pin still remaining free for checking. Dial bore gages cover a range of $\frac{5}{8}$ to 12 in. with indicator in gradu-

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RELIANCE Job-Titted SERVICE **WORKS FOR YOU-**RELIANCE

Job-Fitted PRODUCTS AND SERVICES

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COLD ROLLED STRIP STEEL*

Coils ... Cut Lengths ... All Tempers Slit, Sheared, Deburred and Round Edge .. From WAREHOUSE and MILL DEPOT STOCKS. or DIRECT-FROM-MILL

*Detroit Steel Strip is Strip Steel in Name and in Fact

SHEETS

Cold Rolled . . . Hot Rolled Hot Rolled Pickled . . . Long Terne Galvanized Standard or production sizes or cut to actual working dimensions PRIMES or COST-SAVING SECONDS**

From

WAREHOUSE STOCKS

**Reliance Job-Fitting Methods apply to seconds as well as primes

It would be a miracle if even a large warehouse could always furnish exactly what you need, as much as you need, when you need it. That holds true whether steel is plentiful or scarce.

Reliance JOB-FITTED service recognizes that fact. That is why it goes deeper than routine order taking and order filling. It means a business-like study of the mechanical as well as the economic aspects of your job.

The result . . . material best suited to do a specific job at a specific time . . . and all factors considered, at lowest cost to you.



DEPENDABLE DAN OUR CUSTOMERS' MAN We'll gladly demonstrate, subject to availability of material.

CORPORATION

PRODUCERS OF Coke and Coal Chemicals - Pig Iron - Ingets Slabs - Sheet Bars - Rillets - Wire Rods Manufacturers' Wire - Merchant Wire Products

GENERAL OFFICES DETROIT 9, MICHIGAN

Cold Rolled Strip Steel

COPYRIGHT 1950 D.S.C.

Processors and Distributors JOB-FITTED Sheet and Strip Steel

GENERAL OFFICES - BOX 4308 - PORTER STATION, DETROIT 9, MICHIGAN PLANTS

CLEVELAND PLANT, 3344 E. 80th St., VUlcan 3-3600, Cleveland 4, O. DETROIT PLANT, 13770 Joy Road, WEbster 3-5866, Detroit 28, Mich. EASTERN PLANT, State & Edmund Sts. (Hamden), New Haven 7-5781, New Haven 7, Conn. MIDWEST PLANT, 1601 South Wolcott Ave., CAnal 6-2442, Chicago 8, Ill.

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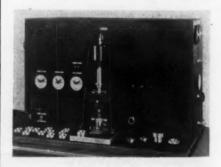
ations of 0.0001 in. The gage employs three-point alignment and two-point gaging. The indicator reflects bell mouth condition, out-



of-roundness and taper and gives size of bores. Nilsson Gage Co. For more information, check No. 42 on the postcard on p. 37.

Pneumatic Relay

The new Moore pneumatic precision relay is the key to the use of the company's air gages in automatic gaging. The relay is used with air-electric switches and other equipment requiring accurate, highspeed operation. Sharp cut-off action is provided. The cut-off point can be set for any pressure between zero and 35 psi. Overloading with



input pressures up to 70 psi will not damage the instrument. The design provides a high amplifying ratio so that a very small change in input pressure results in a full change in output. The semi-automatic gage illustrated measures bore taper and all finished dimensions on automotive roller bearing races, simultaneously, furnishes a direct reading of taper variations



BESLY TAPS-the TWIST DRILLS TITAN ABRASIVE WHEELS AND DISCS—individ-ually formulated GRINDERS that AND REAMERS
—Complete line for every need. for your job.

CHARLES H. BESLY & COMPANY

122 N. Clinton Street . Chicago 6, Illinois Factory: Beloit, Wisconsin

Eliminates Leaks...Boosts Production 300% with "Manual Lincolnweld"



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Fig. 1. Production up 300%. Above (center) is honed cylinder ready for steel insert. At left, assembly is ready for "Manual Lincolnwelding." At right, solid one-piece unit after welding.



Fig. 2. "Manual Lincolnwelding" at The Ohio Honing and Hydraulic Co., Cleveland, Ohio. Fixture rotates past welding gun. Note absence of spatter and smoke for easier, safer welding.

By ALBERT BLEWETT, President The Ohio Honing and Hydraulic Co. Cleveland, Ohio

Dense, uniform welds now being produced faster and easier with the "Manual Lincolnweld" are eliminating former difficulties of leakages in hydraulic cylinders resulting from porosity in welds. Hard spots in weld metal have been overcome, greatly simplifying subsequent machining operations. In addition to a better design, the rate of production has been increased 300%.

The cylinder is made from high carbon tubing (Fig. 1) that has been previously bored and honed. The 1020 steel insert, faced on the inside diameter with bronze, is pressed and welded to the cylinder. The welding is done in a rotary fixture (Fig. 2) that moves the work past the electrode. With "Manual Lincolnweld" the electrode is fed automatically into the work at a predetermined rate set on the welder controls. The granular flux, fed from the welding "gun", maintains a protective blanket over the arc to shield the arc during welding and thus produces a smooth, uniform weld having deep penetration.

A flux dam (Fig. 3) made from a carbon ring is used to confine the granular flux and facilitate easy recovery of unused flux with a vacuum recovery unit. The slag is then quickly removed with an air operated chipper. After

welding, the end of the cylinder is faced and the insert bored. The final operation is simply to grind the outside diameter of the cylinder to size.

WELDING IS DONE AFTER MACHINING

With "Manual Lincolnweld," the welding can be done after the inside diameter of the cylinder has been honed to size. By means of its concentrated arc welding beneath the covering of granular flux, welds can be completed with negligible distortion.



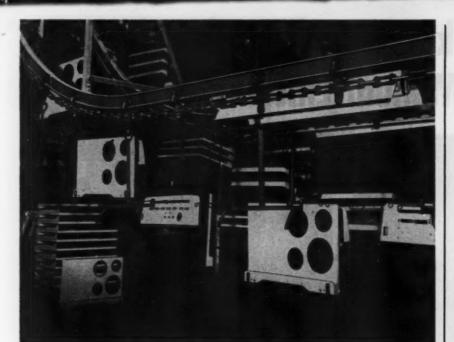
Fig. 3. Removes Flux with vacuum recovery unit shown above, at left. At right is chipping of weld slag in trough of flux dam.

GET THE FACTS Write for Bulletin 373 "Manual Lincolnweld."

THE LINCOLN ELECTRIC COMPANY
Dept. 54, Cleveland 1, Ohio

Sales Offices and Field Service Shops in All Principal Cities





CONVEYORS SPEED Hotpoint RANGE PRODUCTION

Industrial production history was made when Hotpoint, Inc., Chicago, began to make electric ranges in its completely mechanized "world's largest range plant." A vast network of more than 7 miles of overhead materials handling equipment permits amazing speed and high quality manufacturing. The production cycle from steel stocks to finished ranges takes less than one day.

WEBB conveyors are an integral part of the Hotpoint manufacturing process.

WEBB Conveyor Systems are "tailored" to the requirements of any plant, large or small . . . and soon pay for themselves in higher efficiency and lowered production costs.



OFFICES IN PRINCIPAL CITIES

NEW PRODUCTION IDEAS

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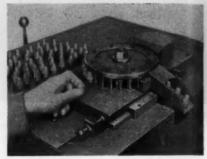
com

Th shop

as small as 0.00005 in. and sorts pieces within all five tolerances. Up to 1700 pieces per hr may be gaged. Moore Products Co. For more information, check No. 43 on the postcard on p. 37.

Marking Machine

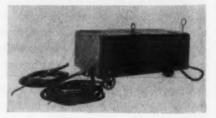
A combination dial feed and rotary marking operation features a machine designed for marking



cone shaped parts. The marking is accomplished by a short dwell in contact with a rotating die as it rotates the part in the ring dial. This ring dial is adjustable for marking depth. After the marking, a guide carries the part out on a chute. An ac 1/2 hp 60 cycle, single phase motor is mounted inside the machine with variable speed unit. Acromark Co. For more information, check No. 44 on the postcard on p. 37.

Steam Cleaner

Designed for use underground, or where gaseous or explosive mixtures have made cleaning impractical, an all-electric steam cleaner is



said to remove grease, dirt, and other deposits from machinery, equipment, floors, etc., ten times faster than by hand methods. The cleaner properly mixes a constant amount of water with the desired amount of dissolved cleaning com-

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THE IRON AGE



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Ajax Wide Adjustment Forging Rolls, with the new combination roll shafts, combine all the advantages and economies accruing to the roll method of producing tapered or reduced forgings, and preparing blanks for subsequent forging operations.

FLAT BACKED SEGMENTAL DIES. For short reductions, these economical dies are bolted to the roll shafts between the housings so as to permit quick setting and easy changes. They are economical to make, as most of the machining can be done on both dies simultaneously. They weigh little, can be of high alloy steel. After machining, they can be heat-treated to a high hardness, and the back surfaces can be ground to correct any warpage.

SEMI-CYLINDRICAL DIES. For middle length work, these dies prove most economical. They likewise are bolted to the roll shafts between the housings, and can be conveniently changed. Most of the machining on the two halves can be performed simultaneously when mounted on an arbor. When the work is not too long they can be made reversible, mouthed out at both ends of the impressions where the majority of die wear occurs.

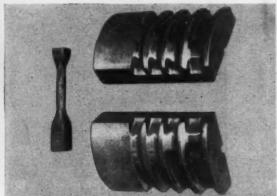
FULL CYLINDRICAL DIES. For long work these dies are mounted on the overhanging right-hand ends of the roll shafts. They can be made most economically as rings, with the cut-away portion only sufficient for feeding the blanks. Their width is limited by permissable overhang, so that the number of grooves must be limited. Overhung mounting permits easy change.

With all three types of dies, there is the great advantage of Ajax Patented Wide Adjustment Gearing, which gives as much as 4 inches adjustment between the roll shafts, permitting as many as ten die redressings. It also makes it easy to maintain the impressions in proper lead match.

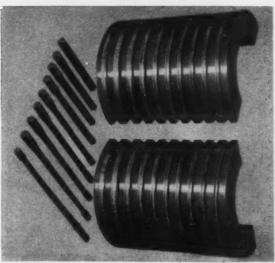
The self-contained construction permits moving these machines around the shop to work in conjunction with different Presses or Hammers, wherever their service is required

Continuous operation gives highest production when a considerable series of roll passes is required, but stop-motion with air clutch can be furnished when of advantage in feeding and locating the stock accurately into complex die impressions. Write for Bulletin 91-A.

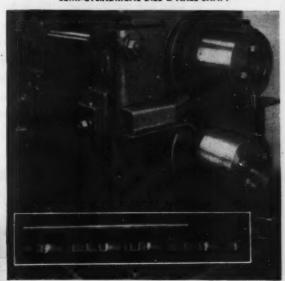
NEW AJAX WIDE ADJUSTMENT FORGING ROLLS



FLAT BACKED SEGMENTAL DIES & CON ROD BLANK



SEMI-CYLINDRICAL DIES & AXLE SHAFT



FULL CYLINDRICAL DIES WITH BLANK BEFORE AND AFTER ROLLING

Continued

pound, and pumps the mixture through a manifold where it is electrically heated in progressive stages. At 100 to 200 lb normal operating pressure, the boiling hot solution and vapor are ejected from the cleaning gun in a 60 gph blast that cuts, dissolves, and flushes away the heaviest dirt and grease deposits. Homestead Valve Mfg. Co. For more information, check No. 45 on the postcard on p. 37.

Magnetie Chucks

A newly developed work-holding fixture for general purpose milling work is a complete unit with Viking chucks mounted on an ad-



justable fixture. Chucks are easily and quickly adjusted as required by the size of the workpiece and positioned at any angle from zero to 90° for accurate milling cuts. The Power-Grip magnetic fixture shown can be quickly and easily set up to hold the motor frame part for eight different milling cuts. Sundstrand Magnetic Products Co. For more information, check No. 46 on the postcard on p. 37.

Electric Hoist

Lifting speeds up to 41 fpm, a lower and upper limit stop, and a wide pick-up angle are new performance features of the chaintype Load King electric hoist. Link chain over an electrically driven sheave supports the load. The single-strand load chain securely engages six pockets of the sheave to move and hold heavy loads with a minimum of chain friction. The hoist hook can reach out 30° from the vertical to pick up loads. The limit stops operate when the hook



General machine shop and maintenance work often require an all-purpose heavy duty open-gap forcing press adaptable to the many kinds of operations involved. That's what makes this versatile 100-ton R. D. Wood HydroLectric press valuable to you, from both cost and production standpoints. Moreover, it's used for machinery and appliance component assembly on a production basis, with the addition of suitable fixtures and accessories. It's made in various sizes and capacities, to strict R. D. Wood manufacturing standards. Write, without obligation, for literature.



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Theasons why a 5HEAR-5PEED can cut your gear costs

The Shear-Speed is not a single purpose machine. It can be used to cut costs on:

- 1. Spur gears or splines in either mass production or job lots.
- 2. Either internal or external gears.
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Someres ? from blank to finished gear Sonibush

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ASTE EXPOSITION

Increase cutting speeds 3 to 10 times

Make one cut do the work of two

Avoid re-annealing and heat-treating

Eliminate unnecessary machine downtime

Reduce or eliminate grinding expense

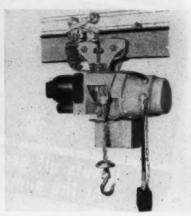
Keep tool inventories to a new low



NEW PRODUCTION IDEAS

Continued

reaches predetermined levels and breaks the electrical circuit to return the pushbutton controller from the up or down position to neutral.



The hoist is available in 500, 1000, and 1500-lb load capacities. Yale & Towne Mfg. Co. For more information, check No. 47 on the postcard on p. 37.

Sheet Cutting Machine

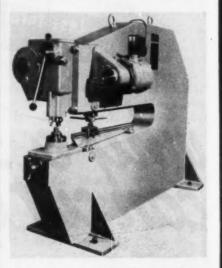
The Pullmax Major, largest of a line of seven machines, cuts the finest gage steel plate up to 11/32 in. thickness. The machines do straight cutting, inside or outside circle, square, and design cutting,

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slot cutting, beading, folding, flanging, and nibbling. Cutting is performed by a movable upper tool that operates at high reciprocating speed. The cutting operation does not chip or deform edges, and in most cases, edges require no further finishing after cutting. The machines will work stainless steel,

Defects in Connecting Rod Forgings shown by Magnaglo under black light.

Plants Realize Big Savings with TROUBLE SHOOTER

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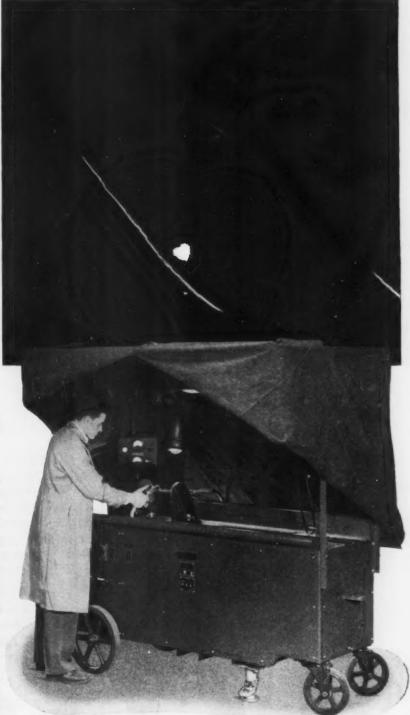
TO CONTROL PROCESSES

● Many a plant is finding that the mobile, self-contained Magnaflux* KDN Unit can be moved strategically "all over the place" as a check on processing faults.

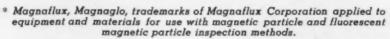
In a foundry, tool or forge shop, such a unit can be spotted wherever there is trouble. It uses Magnaglo* for easily-seen glowing fluorescent indications of cracks, laps, etc., viewed under black light. Sampling or 100% inspection is carried out until the process is under control.

Finding the fault in the process uncovers the cause of cracks and similar defects in thousands of parts. The saving in subsequent machining labor alone will pay for the inspection equipment rapidly. Often the first big job pays all costs plus profit on process control.

Give some thought to the application of a Magnaflux KDN Unit as a mobile process control tool in your plant. A letter will bring the facts for your consideration of this form of flexible and inexpensive, nondestructive testing. Write us.



MAGNAFLUX Type KDN — portable unit for magnetic particle inspection by Magnaflux or by Magnaglo as shown above with hood and black light for quick plain fluorescent indications. Completely self-contained with agitated inspection bath. For parts to 54" long and 10" in diameter. Both circular and longitudinal magnetization with contact heads and coil.





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Export Distributor: Curtis Wright Corp.

In Canada: Williams & Wilson, Ltd.

Continued

nonferrous metal, wire mesh and plastic sheets. American Pullmax Co., Inc. For more information, check No. 48 on the postcard on

Balancing Machine

Production balancing of rotating parts such as clutches, magnetos, impellers and flywheels, wherever the diameter of the work is considerably greater than its axial length, is possible on a new vertical balancing machine. Both the



amount and phase of unbalance is indicated simultaneously by the trace on a 5-in. cathode ray tube. When the work is oriented so as to light a signal lamp, the spot to be drilled for balance correction is directly under the drill point, drilling depth having already been indicated by the scale reading of the cathode ray tube trace. Precision balancing at speeds up to 75 parts per hr is possible. R. B. Annis Co. For more information, check No. 49 on the postcard on p. 37.

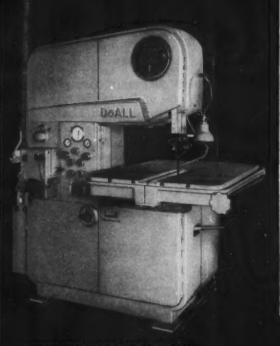
Dividing Head

Designed for dividing operations in layout, squaring shafts, fluting taps, gear cutting, splines, reamers, hex screws and cams, the Marvin Dividing Head is mounted on two heavy trunnions and has a conven-



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Tool with Complete Hydraulic operation.



Continuous BAND CUTTING Now Extended to the MACHINING of ALL SOLID MATERIALS

New DoALL Band Machines and Cutting Tools for 1950 give up to 200% faster production cutting and up to 100% longer tool life. Tough alloys and other materials that have defied economical cutting

are now profitably machined.

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These latest Tool Room and Manufacturing Tools will be in operation on materials demonstrating:

Line Milling

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Line Grinding

Low-Cost Utility DoALLs, 5 models,

various speeds. 16" capacity

"Crush Grinding"

Friction Sawing Integrated Inspection

DoALL Exhibit #121 and #125



Contour Machines—5 models from 16" to 60" capacity.



Line Milling
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Continuous Filing
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Honing



Super Zephyr—21 models for high speed sawing.

Gage Blocks are integrated with a complete line of measuring instruments.



"Cool Grinding" and the DoALL Super Precision Grinder, 7 models.



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HERC-ALLOY... the chain you can SEE is safe

A simple visual inspection* is all that is needed to determine the continued serviceability of a HERC-ALLOY Chain. That's why more and more of the important companies are "standardizing on HERC-ALLOY...because HERC-ALLOY Chains are immune to

> unseen dangerous crystallization ... because you can see when a HERC-ALLOY Chain needs repairs or replacing.

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NEW PRODUCTION IDEAS

Continued

tional 40:1 worm gear, adjustable for take up. It can be tilted 125°: 5° below horizontal and 30° past vertical axis. Three index plates have 6 sets of holes each. The tail stock with 1/2 in. travel has two pins



for horizontal alignment with the head stock, and is vertically adjustable for tapered work. spindle nose has a No. 2 Morse taper socket and a 1-in. diam thread of 10 pitch. Marvin Machine Products, Inc. For more information, check No. 50 on the postcard on p. 37.

Relief Grinder

The improved I-G-C relief grinder. Model 100-B, handles with equal speed and accuracy countersinks, center drills, integral pilot cutters and pilot drills, either right or left hand. The working head can be set at any position, speeding up cutter grinding operations by 300 pct. it is reported. Model 100-B fits any

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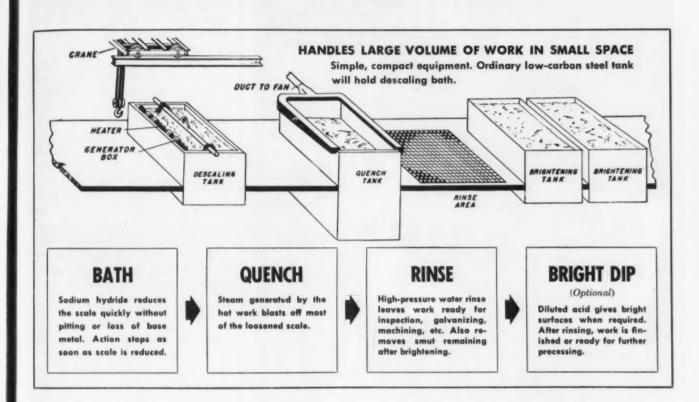


standard grinder and handles work from 1/16 to 1 in. diam with standard collets. Special built-in indexing pins provide faster and more accurate grinds, and adjusting pins permit, 1, 2, 3, 4, 6 and 12 fluted cutter grinding. S & D Engineering Co. For more information, check No. 51 on the postcard on p. 37.

Resume Your Reading on Page 41

YOU CAN CLEAN WORK OF ANY SIZE

easily, quickly, economically with the Du Pont Sodium Hydride Descaling Process



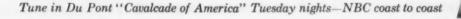
REMOVE SCALE quickly and completely from a wide variety of metals, alloys, and bimetallics—in any size or shape—with this modern descaling method.

HANDLE DIFFERENT METALS in the same operation . . . alloy steels, stainless steels, nickel, cobalt, copper, chrome . . . any work not affected by the carrier bath of fused caustic at 700° F. Installations now in operation are descaling all types of finished articles and processed stock, ranging from small parts weighing only a fraction

of an ounce to huge stainless sheets over 3 tons in weight.

FOR COMPLETE INFORMATION on a process that can mean important savings in metal, time, space, equipment, materials, and the disposal of waste products—mail the coupon below. It will bring you promptly a

copy of "Du Pont Sodium Hydride Descaling Process," which describes the process and tells how easily it can be installed and used.



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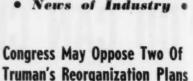
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Washington - Nearly all of President Truman's latest batch of 21 plans for reorganizing the federal government appeared this week to be headed for congressional approval, but indications were that at least two of the White House proposals would encounter bitter opposition.

The two reorganization proposals which Congress is expected to oppose deal with the National Labor Relations Board and the Maritime Commission. Mr. Truman seeks to make the NLRB general counsel subject to the orders of the board itself. Under the Taft-Hartley Act, the NLRB general counsel may act independently of the pro-labor board. As far as the Maritime Commission is concerned, Mr. Truman would abolish that agency and transfer its functions to the Commerce

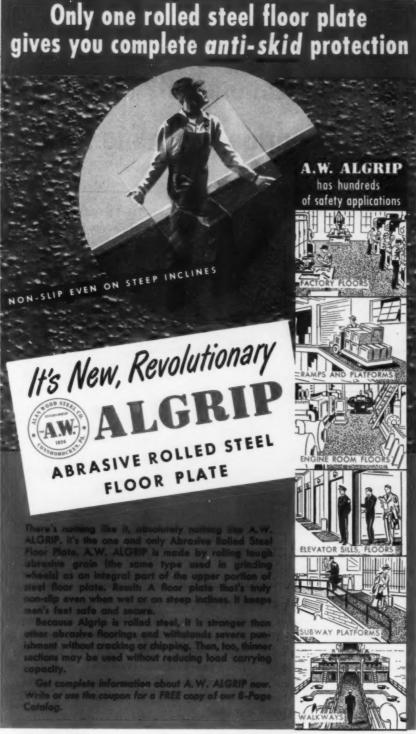
Plans Become Law May 13

All of the 21 reorganization plans become law automatically on May 13, unless Congress acts to block any of them. This power of the White House to "legislate in reverse," granted by Congress last year, has been the subject of considerable criticism by Republican members of Congress.

Aid Turkish Coal Development

Chicago-Development of Turkish coal resources under the Marshall plan will be aided by a group of American mining engineers, who have left for a two year assignment as advisers to the Turkish government agencies concerned. The group is composed of members of Paul Weir Co., Chicago mining engineering and construction firm, led by Lee O. Richards, the company's vice president in charge of foreign operations.

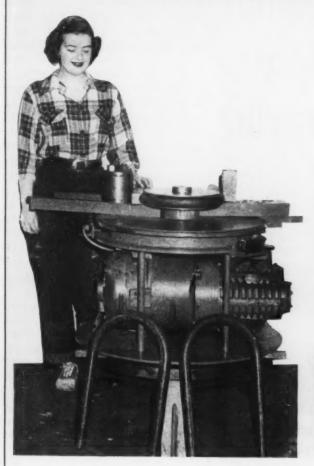
The engineers will serve as advisers and consultants in the \$45 million development and mechanization of the Zonguldak coal field, owned by the Turkish government.



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Pedrick Production Benders will bend Pipes, Tubes, Strips and Shapes as well as bar stock. Simple bends may be made in production quantities as well as full circles and helical coils. The machines run either clockwise or counterclockwise, thus permitting complicated bends to be made with ease. A production run. clocked with a stop watch, bending 2" pipe in short lengths to right angles, produced 200 bends per hour. Padlock shackles of 5/16" bar stock bent in multiples of 8 with a loading jig and one female operator produced an average of 2460 pieces per hour. High production means low cost per piece. We can do a similar job for you.

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Wyandotte F.S.* Cleaner, a heavy-duty electrocleaner, is particularly recommended for cleaning ferrous parts.

F.S. is designed to remove fabricating compounds and fabricating smut before electroplating.

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SERVICE REPRESENTATIVES IN 88 CITIES



U. S. Steel Subsidiary Spurs Products Development Program

Dallas — The manufacture of new products and improved machinery is part of the stimulated product development program being conducted by the Oil Well Supply Co., a subsidiary of the United States Steel Corp., declared Fred F. Murray, president, last week.

The employment of new and more modern manufacturing methods in the company's Imperial Works, Oil City, Pa., and other plants is the impetus to its expanding line of oil country goods, which include equipment for oil drilling and production.

Mr. Murray predicted a strengthened demand for equipment in 1950 to surpass 1949, in which supply and demand came "nearer in balance" and an output decline was registered from the 1948 figure, highest in the firm's history.

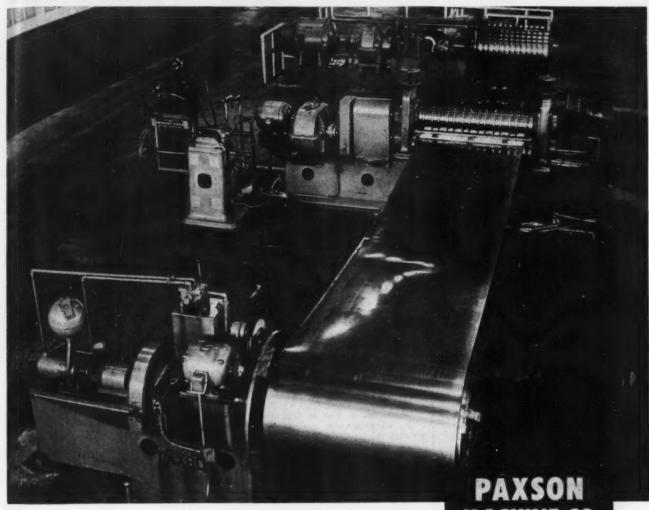
Introduced as new products were high tensile, durable sucker rods, toughened by an exclusive heattreating process and of smaller diameter than those ordinarily used for pumping wells at depths of 8000 to 10,000 feet; and a patented automatic weight control to regulate the total weight on a drill bit. The latter item enables a driller to select the weight he wants on the bit.

Norway Estimates Imports

Washington — More than \$45 million worth of goods will be imported by the Norwegian government from the United States under the Marshall Plan during the first half of 1950. This is the first time that any ECA country has estimated its probable needs on any except on a long term, general basis.

Roughly 65 pct of about \$32 million of the total imports will consist of iron and steel, machinery and equipment, motor vehicles and tractors and other types of industrial goods. The value of plates sheets, tubes, bars, wire rods and wire to be imported came to \$8 million; copper, brass and bronze, \$600,000; and semi-manufactured nonferrous metals \$150,000.

PAXSON GIVES YOU THE EDGE



Line shown operating at Andersen-Carlson Mfg. Co., Torrance, California, one of many tube manufacturers using PAXSON lines.

PAXSON MACHINE CO. Salem. Ohio

PAXSON. Your investment in PAXSON STRIP SLITTING MACHINES will assure smoother production schedules, lower inventory costs, and larger profits.

PAXSON SLITTERS have widths from 24" to 60" and can handle light and heavy gauges, various coil weights, and coil inside diameters.

DO YOU FLY? 2800 ft. E. W. runway and clubhouse, private field 2 miles west of Salem maintained for your convenience. Wire or phone arrival time. We will meet your plane.

PAXSON MACHINE COMPANY, ENGINEERS AND BUILDERS OF COLD-ROLLED STRIP-MILL EQUIPMENT, SPECIALIZING IN SLITTING LINES

REMEMBER ALL PAXSON LINES ARE CUSTOM BUILT

March 30, 1950

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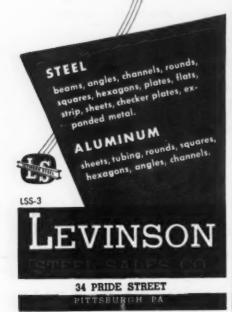
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our almost fanatical desire to give every customer the best warehouse service possible to obtain . . . a fact that you can prove for yourself, next time you need any of the products listed below:



Tool Engineer's Notebook

Continued



JO

Trim of drawn sheet metal parts.

PROBLEM

Find a fast method of accurately removing excess metal from the drawn shell to obtain the correct depth of part.

SOLUTION

Installation of Brehm trimming dies for the flat edge trimming and notching of drawn shells. Parts are manually positioned for the operation, and trimmed to \pm 0.001 in. on the depths of the parts. Metal thicknesses from 0.005 in. brass to 0.218 in steel have been trimmed. All trimming operations are completed in one press stroke.

SAVING

Production as high as 1200 per hr can be obtained with optimum conditions since the part is trimmed in one operation and the shell and scrap can be blown from the die. The rate of 125 per hr was achieved with only one press stroke on electric refrigerator doors. This job formerly required eight operations for complete trimming. Electric iron covers are being trimmed at the rate of 600 per hr.

Data courtesy Steel Products Engineering Co., Springfield, Ohio.



JOB

Boring and chamfering aluminum castings.

PROBLEM

To reduce floor-to-floor machining time. The aluminum casting required rough boring of two diameters, a chamfering operation, and finish boring of one diameter.

SOLUTION

Two special Madison boring tools were used. The first was a multiple-cutter,

rough boring bar incorporating two rough boring cutters and a chamfering cutter. The second was a reaming bar with a standard reaming cutter to ream the finish bore diameter while holding 0.005-in. tolerance on hole size.

SAVING

With previous tooling, 19.7 parts per hr were completed. With new setup 33.6 parts per hr were produced. This amounted to a 70.5 pct production gain.

Data courtesy Madison Mfg. Co., Muskegon, Michigan.



JOB

Rough cut SAE 1350 steel bars from 4 in. down to 2 1/16 in. diam.

PROBLEM

Hogging cuts cannot be made at high speed with a dead center.

SOLUTION

By using ideal live centers and carbide tipped tools, hogging cuts can be taken since there is no friction between the live center and the work.

SAVING

Production increase on this job by using live centers over ordinary dead centers was 75 pct.

Data courtesy Ideal Industries, Inc., Sycamore, III.



JOB

Mill automobile rear axles to length.

PROBLEM

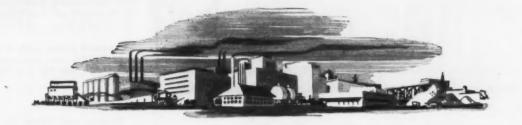
Find a cheaper, faster method. The operation was performed on a milling machine with an inserted high speed steel cutter. Grinding and blade cost amounted to \$0.119 per axle.

SOLUTION

Machine was tooled with an axial face
Turn to Page 202

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"We Added an Hour's Production Time Daily,

by Investing Just \$2640!"



Alemite
Cuts Costs 3 Ways

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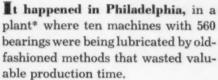
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1. In Transferring Lubricants... by eliminating mess, expensive contamination—and cutting man hours 63% for every 100 pounds of lubricant transferred.



2. In Loading Grease Guns... by saving 3% man hours for every 100 pounds of lubricant loaded into hand guns.



An Alemite Lubrication Engineer was consulted, to work with the plant engineers and help find a solution to this problem, an all-too-common one in industry today. A modern Alemite Centralized System was planned and installed, to lubricate all 560 bearings from a central point. Total cost—\$2640. Lubrication time was cut from four man-hours to 10 minutes per week. A whole hour's production time was added to every working day, and the resulting added revenue paid for the entire project in just 66 days.

No matter what size or type of plant you operate, Alemite can show you dozens of ways to make worthwhile savings through more efficient handling of petroleum products. These are facts which you can readily confirm in your own time studies. Contact your local Alemite Industrial Distributor now. Or send for free booklet "11 Ways to Cut Production Costs." Simply attach coupon below to your letterhead. Alemite, Dept. N-30, 1850 Diversey Parkway, Chicago 14, Ill.

*Name on request

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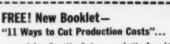
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Another Product of Stewart-Warner



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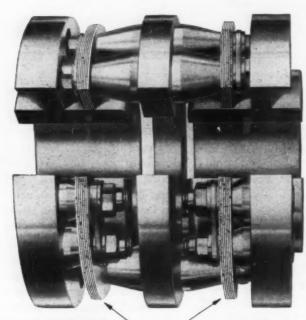
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FOR POWER TRANSMISSION . REQUIRE NO MAINTENANCE

Patented Flexible Disc Rings of special steel transmit the power and provide for parallel and angular misalignment as well as free end float.

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Specialists on Couplings for more than 30 years



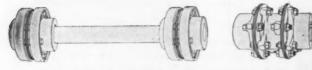
PATENTED FLEXIBLE DISC RINGS

FRICTION
WEAR and
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are eliminated
LUBRICATION IS
NOT REQUIRED!

THE THOMAS PRINCIPLE GUARANTEES
PERFECT BALANCE UNDER ALL
CONDITIONS OF MISALIGNMENT.

NO MAINTENANCE PROBLEMS.

ALL PARTS ARE SOLIDLY BOLTED TOGETHER.



Write for the latest reprint of our Engineering Catalog.

THOMAS FLEXIBLE COUPLING CO.

Tool Engineer's Notebook

Continued

Kennamill having grade K2S blades. Almost 69,000 rear axles were face milled to length with this 8-in. diam cutter in 6 months.

SAVING

Grinding and blade cost was \$0.04. Based on the number of pieces milled, \$6148.78 was saved in grinding and blade costs and \$1770.60 in direct labor, resulting in a total saving of \$7919.38.

Data courtesy Kennametal, Inc., Latrobe, Pa



JOB

Turn small parts from round steel, aluminum, and plastic rods.

PROBLEM

Eliminate the need for carrying a full set of 64 collets to cover each 1-in. range, and eliminate the pinching of work resulting from the use of off-size collets.

SOLUTION

Jacobs spindle-nose lathe chucks were installed on all machines. Eight chucks replaced 64 collets. Each rubber set collet has a close-down range of ½ in. Gripping power was found to be 2 to 4 times greater than standard steel collets. Stock was never pinched or scored.

SAVING

The number of collets necessary to bridge stock size range was reduced from 64 to 8. Rejected parts were reduced since there was no material pinching.

Data courtesy Jacobs Mfg. Co., Hartford,



JOB

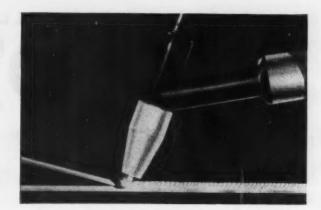
Grinding 76 tooth ratchets.

PROBLEM

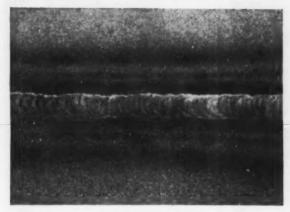
High accuracy of concentricity and spacing had to be maintained in grinding of these ratchets. Both faces of ratchet teeth had to be identical as to angle and position. Tolerance require-

Ma

Weld Sheet Steel with the HELIARC torch



and wipe out one complete operation



AS WELDED — This photograph, unretouched and natural size, shows that Heliarc welds in sheet steel are clean and uniform,

There is no spatter or flux, so you save cleaning costs when you switch to the Heliarc process for welding sheet steel. And you keep the advantages of high speed, and minimum distortion that are characteristic of arc welding. Any manual are or gas welding operator finds welding with a Heliarc torch easy to master.

Porosity-free welds in killed low-carbon steel up to ½ in. thick can be made with this process. In non-killed grades, welds are as nearly gas free as can be produced by any welding process. Argon-shielding prevents pick-up of atmospheric gases. No argon is dissolved in the weld.

Joints welded with the Heliarc torch will not show under paint, lacquer, or even vitreous enamel finish. It takes only a light grinding to remove the low, smooth ripple and make the bead flush with the surface.

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Company

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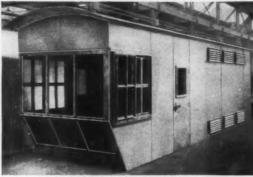


FACILITIES FILE NO. 505 sent on request





Steel Mill Roll Tables

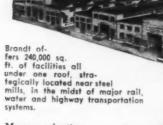


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Tool Engineer's Notebook

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ments were \pm 10 sec of arc on each tooth with no accumulated error.

SOLUTION

An OPL optical dividing head was set up for the job. Spindle run out on this mechanism is held to within 0.0002 in, and maximum error of indexing in 360° is held within 0.0005 in. measured at periphery of 12 in, circle. Fine graduations on the graduated drum invisible to naked eye, are selected and controlled accurately through an optical magnifying system.

SAVING

Accuracy improved approximately 100 pct over four previous methods. Production time and scrap parts were reduced considerably.

Data courtesy F. T. Griswold Mfg. Co., Wayne, Pa.



JOB

Inspect in production angle gage blocks.

PROBLEM

To inspect to greatest accuracy with a portable instrument that is independent of temperature changes and not subject to wear.

SOLUTION

To inspect with Watts 18 in. Auto Collimator with which angles can be determined to the accuracy of $\frac{1}{2}$ sec of arc (0.0000025 in. per in.).

SAVING

Inspection time was reduced by about 25 pct in comparison with previous optical method.

Data courtesy Engis Equipment Co., Chicago.



JOB

Precision truing of newly mounted grinding wheels.

PROBLEM

The need for an effective truing tool permitting ease of operation, speed and low cost. This was a problem because of the unusual wear resistance of the metal and vitrified bonded diamond wheels that were used.

THE IRON AGE

SOLUTION

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A Norton brake-controlled truing device was installed. This small, compact, self-contained unit was driven by the wheel being trued. The device was placed on the grinding machine table with its spindle parallel to peripheral type wheels and perpendicular to cylinder types. The wheel was trued as the device was traversed past at the rate of 30 to 60 ipm and at a downfeed of 0.0005 to 0.001 in. per stroke. Brake shoes were adjusted to give silicon-carbide truing wheel a top speed of 1250 fpm.

SAVING

Comparison of new method with two previous methods showed that truing time was cut from 30 min to approx. 5 min.

Data courtesy Norton Co., Worcester, Mass.



JOB

Milling carbureter and hot spot faces, and port flanges on intake manifold.

PROBLEM

Eliminate multiple setups and perform all milling operations on one machine. Maintain accurate relationships between all surfaces.

SOLUTION

A special machine was designed for the job, consisting of a bed supporting a 40-in. diam, 3-station rotary indexing table on which are mounted three hand-clamping fixtures. Each fixture is designed to hold one intake manifold. A vertical traveling head, with two vertical spindles, performs the milling of the intake port flanges. Both milling operations are performed simultaneously during loading. Controls are grouped on an extended arm to be easily accessible to the operator. Production rate is 120 pieces per hr.

SAVING

No comparison can be made as this is a newly designed piece.

Data courtesy Kearney & Trecker Corp.,

Milwaukee.



JOB

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Perforating holes in the handle portion of steak and bread knives. Knife material used was AISI 410 and 440 stain-



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FOR UALITY

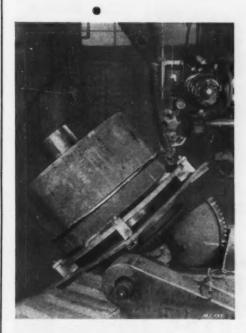
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Purchasing Executives, Design

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less steel, in thicknesses from 0.035 to 0.112 in.

PROBLEM

In the manufacture of these parts the following conditions existed: Punches would not stand up; perforated parts came through with burrs making necessary a deburring operation; slugs plugged up die bushings.

SOLUTION

Three sets of dies were provided one for each of three thickness ranges. Die bushings were taper reamed to eliminate slug jamming. A better grade of tool steel was used in die manufacture.

SAVING

Resultant savings to customer were: An increase of over 400 pct in production: a 50 pct reduction in tooling costs. Date courtesy Fidelity Tool Supply Co., Camden, N. J.



JOB

Form 11/2-in. diam steel whorls, a type of spindle used in the textile industry.

PROBLEM

Increase production per tool.

SOLUTION

The adoption of Vasco Supreme for this form tool. The figure shows the form tool and the product.

SAVING

Production increased from 5000 to 32. 000 pieces per tool.

Data courtesy Vanadium-Alloys Steel Co. Latrobe, Pa.



JOB

Cutoff of cross-section sprues and risers on heavy brass railway bearing castings containing 15 pct lead.

PROBLEM

To find a faster, safe method of cutting these and other nonferrous castings. Breakage of conventional abrasive cut-off wheels had caused use of wheels to





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Norflex reinforced resinoid cutoff wheel of laminated construction was installed. Wheel construction features layers of reinforcing material molded with an abrasive and resinoid bond. Its knurled sides with file-like cutting edges permit fast cutting through metal and provide chip clearance when cutting large cross-sections.

SAVING

The 18-in. diam, 3/16-in. thick Norflex cutoff wheel replacing the steel saw lowered the cutting time on one 3½x9-in. cut from 55 min to less than 3 min.

Data courtesy Narton Co., Warcester, Mass.



JOB

To produce plastic and metal extruded shapes of best obtainable finish and correct contour.

PROBLEM

To finish extrusion dies from hardened steel or tungsten-carbides so that extruded parts will be satisfactory. Specific problem was to avoid excessive die wear and tears in extruded material from build-up formed on die surface.

SOLUTION

Finish extrusion die with Hyprez Diamond compounds to mirror polish and exact required contour, reducing friction in the die and completely eliminate buildup.

SAVING

Toolroom time was reduced by approximately 20 hr per month and a better product was produced.

Data courtesy Engis Equipment Co., Chicago.



JOB

Rough face-mill gray iron crankcase with hardness of 220 Bhn to remove 1/8 in. of stock.

PROBLEM

To increase production and reduce unit



DYSON LARGE NUTS



OF SAFETY

FOR
LARGE PRESSES
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When you buy or specify a large nut, your first requirement is safety. Large nuts must be able to "take it" on heavy units of machinery and construction. To meet this requirement of safety, you couldn't select a finer large nut than DYSON. Every DYSON LARGE NUT is carefully forged on flat die hammers. The metal is compacted into a dense, strong mass so that the nut . . . and particularly the threads . . . will meet the severest shock or strain. Dyson employs the most modern hob milling equipment to thread its nuts ... to give the thread a larger contact area with the bolt. Standardize on Dyson Large Nuts . . . fabricated to your exact specifications from carbon and alloy steels. Wire, write, or phone about your requirements.



Tool Engineer's Notebook

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cost using present machinery. Machine was Newton rotary mill with no available increased feeds or speeds.

SOLUTION

A Wesson fine pitch milling cutter with solid carbide Wessonmetal blades was subsituted for previous cutter using cast metal blades. Because of the machine's low speeds and feeds carbide had never worked on this job before. A fine pitch 14-in. diam cutter with 36 blades was installed.

SAVING

Cost per piece reduced from 10¢ to 2¢. Reasons for savings: Less down time for sharpening and replacing blades; less scrappage because of poor finish. Total savings per year, based on average production, is over \$3200.

Data courtesy Wesson Co., Ferndale, Mich.



JOB

Drilling tool and jib parts.

PROBLEM

To eliminate the high drill press accident rate and decrease time consumed in bolting the vise to the drill table.

SOLUTION

Universal safety vises were installed on all round-column drills in the toolroom. The quick acting lock on the vise reduced time consumed in turning the vise in and out on both toolroom and short run production work.

SAVING

Drill press accident rate reduced to zero. Time consumed in locating, clamping and relocating vise considerably decreased.

Data courtesy Universal Vise & Tool Co., Parma, Mich.



JOB

Machining SAE 8640 sulfite forgings.

PROBLEM

To find a faster production method to turn, face, bore, chamfer, recess and thread part.

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SOLUTION

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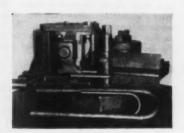
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An Enco heavy duty turret tool-post was installed on the lathe-type production machine doing the job. The 12-position indexing of this turret allows one tool to do as many as three operations. This feature made it possible to do all required operations in one tool setup. After setup was made, operator did not have to gage the successive pieces because the turret holds required tolerance to within 0.001 in.

SAVING

Production time per machined forging was reduced 50 pct.

Data courtesy Enco Mfg. Co., Chicago.



JOB

Fabrication of U-shaped bolts.

PROBLEM

Find a method of manufacture that would simplify operations and eliminate hand straightening. Original method required preheating. During subsequent heat-treating operations locked in stresses were partially relieved, permitted the two sides to spring out of parallel. Extensive hand straightening was required.

SOLUTION

A Pedrick cold-forming rod bending machine was installed. The machine bends ¾ to 1¼-in, radii clips, the top radius conforming exactly to the top of spring pad. No preheating is necessary.

SAVINGS

Production was increased 100 pct. In addition, operation of the Pedrick unit permitted the elimination of a special gas heating furnace. Dimensional accuracy was increased, operator fatigue lessened, and straightening operations after heat treating were reduced.

Data courtesy Pedrick Tool & Machine Co., Philadelphia

JOB

Finishing steel diecasting molds used in manufacture of plastic display racks for silverware.

PROBLEM

Cut down mold polishing time.

SOLUTION

Elgin Dymo, a new diamond abrasive compound developed for mold finishing.

SAVING

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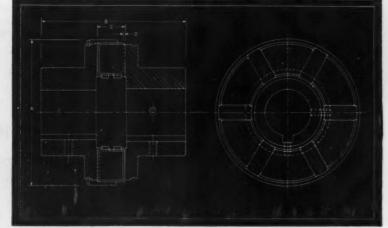
Mold finishing time was reduced more than 80 pct. The molding contractor

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Lovejoy will promptly, without obligation, give the correct answer on your supply of data, h.p., kind and conditions of service.





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Lovejoy L-R Type "H" for heavy duty. Electrical steel castings, and greater number of jaws provide far greater load capacity. Pat. & Pats. Pend.



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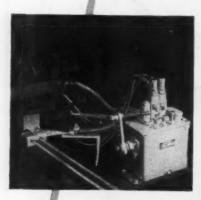
Tough, resilient, free-floating load cushions are suspended between metal jaws. Cushions in plain sight, can be removed and replaced in minutes.

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Punch breakage greatly reduced.

Manzel Spray Lubricators force automatically timed jets of oil spray directly onto the punches, shear knives, dies, rollers, or other parts. The system is readily installed on any type of equipment, large or small.

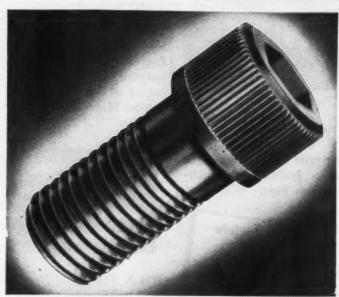
Manzel engineers will gladly assist you in solving any lubrication problems.

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Tool Engineer's Notebook

Continued

estimates that saving should be \$2000 over a 6-months period of mold making. Data courtesy Industrial Products Div., Elgin National Watch Co., Elgin, III.

JOB

Pre-machining inspection of automotive connecting rods.

PROBLEM

To avoid machining parts that are later rejected because of cracks and flaws. Rough forged rods were formerly visibly inspected after pickling finish machined, and then visibly inspected again. This later inspection often showed cracks made apparent by machining. The rejection of many finished rods caused the loss of all machining on these parts.

SOLUTION

A shot blast unit was installed to eliminate the pickling. Two automatic Magnaflux conveyerized units were installed to inspect the rods at up to speeds of 2300 per hr. The Magnaglo showed all cracks with a highly visible fluorescent indicator.

SAVING

Considerable machining normally wasted was avoided since twice as many defectives were discovered before machining. Machining savings amounted to \$100 per day. Labor for pickling and inspection had previously cost \$7.50 per thousand, not counting high pickling material cost and floor space. With Magnaflux installation cleaning and inspection costs are now \$6 per thousand. Additional advantage is a closer control of the supplier of forged rods.

Data courtesy Magnaflux Corp., Chicago.

JOB

Progressive pierce four 0.270-in. diam holes in a 0.250-in. thick hot-rolled steel plate.

PROBLEM

Find a set of dies with low breakage rates and wear characteristics. The set of six dies necessary for this operation involves a progressive pierce, countersink and cutoff sequence. Die life was approximately 12,000 parts per set of punches.

SOLUTION

Standard punch set replaced by six Pivot punches. Parts are being produced with same accuracy, and punches show less wear and no breakage.

SAVING

Over 300 pct increase in punch life. To date, over 38,000 parts have been produced with no apparent signs of punch wear. User predicts die set should pierce 100,000 parts before requiring replacement.

Data courtesy Pivot Punch & Die Corp. North Tonawanda, N. Y.

Resume Your Reading on Page 94

Marc



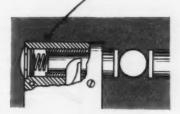
You've used regular "mikes" for such a long time you'll be amazed at the downright accuracy and plain honest-to-goodness convenience you can get with this CONSTANT PRESSURE, INDICATING MICROMETER. Just try it and you'll know why so many are buying it!

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You'll also be pleased with the usefulness of the pushbutton Retracting Anvil and the Tolerance Hands when measuring duplicate parts. You'll find extra value in the *lapped*, Tungsten Carbide Anvils — and you'll just naturally like its nice balance and its *rust-proof*, dull chrome finish.

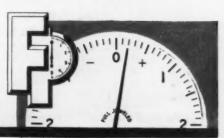
You don't have to take our word for it. Find out for yourself. Ask to see the Federal MIKEMASTER... and to try it on your work. Write to Federal Products Corporation, 1133 Eddy Street, Providence 1, R. I.

You'll appreciate the convenience of reading the Indicator instead of barrel graduations. The constant pressure of the anvil means constant measuring pressure every time.



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Cut machining time and tool costs-WITH THIS "IN BETWEEN" STEEL ... SPEED ALLOY



A hot rolled alloy plate steel, SPEED ALLOY meets the continually troublesome requirement for a readily machinable steel with physical properties higher than medium carbon steels and just under tool steels. Essentially oil hardening, SPEED ALLOY can be direct quenched or carburized to achieve high surface hardnesses. Mold and die makers and machinists are discovering its many economies. It's ideal for these press brake dies made by Dries & Krump Mfg. Co., Chicago.

chromium and molybdenum content of SPEED ALLOY qualify it for tough jobs like this sector gear made by United Precision Gear Co., Indianapolis, made by United Precision Gear Co., Indianapolis, Ind. After trepanning the center and cutting the teeth into the outside diameter, the circle is cut into segments and heat treated. No distortion at all was experienced. Finished parts were fastened to the hitch feeding mechanism of a large punch press — Undoubtedly SPEED ALLOY can cut your costs and solve your tough jobs—plates stocked up to 72" wide and 6" thick flame cut to specifications and specially processed before shipment to insure maximum machinability-Send for bulletin #905.



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President Truman Names New FTC Member: Await Senate Nod

Washington-Martin A. Hutchinson, Virginia Democrat, has been appointed by President Truman to serve as a member of the Federal Trade Commission.

A political foe of Senator Harry Byrd, D., Va., Mr. Hutchinson describes himself as an "independent Democrat" who supports the "liberal humane and progressive programs of Franklin Delano Roosevelt."

Senate confirmation of Mr. Hutchinson's appointment will mean that all five seats on the FTC will be occupied for the first time in nearly a year.

The other members of the FTC are: Lowell B. Mason, chairman, Republican; John Carson, independent and James Mead and William B. Ayres, Democrats. Three of the five seats are supposed to be held by members of the political party controlling the Administration, with the minority party represented in the remaining two.

Interests in Canada Merged

New York - Canadian subsidiaries of the American Brake Shoe Co. have been integrated into a single corporation, the Dominion Brake Shoe Co., Ltd., a wholly owned subsidiary. The move went into effect on January 1.

Acquired by the Dominion Brake Shoe Co. were the operating assets and business of Joliette Steel. Ltd., and Ramapo of Canada, Ltd. The company, offices of which are in Montreal, Quebec, will operate the merged plants through five divisions.

Air Force Awards Contracts

Washington - Recent purchase contracts awarded by the U.S. Air Force included: General Electric Co., BH-1 turbosuperchargers and spare parts and CH7-B1 turbosuperchargers, \$2,871,305; Lear, Inc., Grand Rapids, an F-5 autopilot, \$1,808,391; and General Motors Corp., unspecified quantity. type AC181 spark plugs, \$555,388.

HEADQUARTERS

FOR REDUCING PRODUCTION COSTS

WITH . . .

SPECIAL BRUSHING MACHINES

DESIGNED AND BUILT AT THE FULLER BRUSH CO.

This machine was developed for a manufacturer of hack saw blades. After blades were heat treated, considerable handling was formerly required in removing scale. Now the blades travel through the machine, and not only is handling reduced, but quality is uniform.

Cost-cutting processes are often developed through the use of power brushes—mounted in specially designed machines.

- For this machinery it is logical to consult the engineering staff at The Fuller Brush Company, which for nearly two decades has been specializing on power brush applications. Their work has expanded from brushes to special brushing machinery.
- Special machines designed by Fuller engineers are built in the Fuller plant — one of the larger Eastern machine building shops.
- These facilities for designing and building special brushing machines offer an attractive solution to many processing problems. For additional information simply write and consult our engineers. No obligation. Write today.



A manufacturer of mirrors had this machine designed and built for the mechanical scrubbing of plate glass preparatory to silvering. Hand labor was eliminated. Rotating brushes that run in a detergent, plus a forced spray of distilled water, leave the glass surface chemically clean. The machine, which has a 9° δ^{α} wide by 21' long bed, delivers glass automatically onto a conveyor that feeds into the silvering equipment.

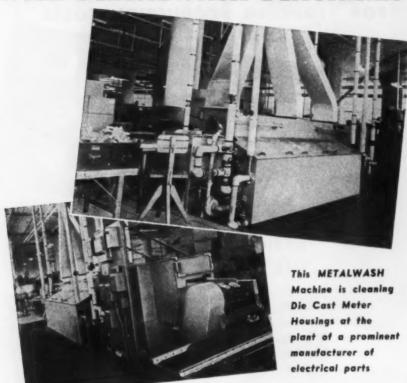
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760 FULLER BRUSH Co.

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Cut Cleaning Costs with METALWASH MACHINES



One of our recently designed Conveyor-type machines, completely equipped with special high-pressure nozzles and powerful standard pumps. This METALWASH machine handles the most difficult cleaning jobs in the quickest time—washing, rinsing, drying the most intricate diecastings with highest efficiency and greatest economy.

Manufacturers with cleaning and drying problems, where high costs are involved, are invited to write or 'phone us. Our engineering service is ready to help you.



Our new and enlarged plant is shown in the above illustration. It covers an area of 30,000 square feet, served by traveling cranes and railroad sidings. New machinery has been installed to provide better and more economical manufacturing of washing machines, pickling machines, dryers and special machinery. Ample space is given to executive, engineering and sales departments.

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Designer

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Elizabeth 4, N. J.

U. S. Highway Route 1
Telephone ELizabeth 2-6876

· News of Industry ·

2,500 Attendance Expected At Midwest Power Conference

Chicago — The twelfth annual Midwest Power Conference scheduled for three days, Apr. 5-7, in this city's Sherman Hotel will be attended by more than 2500 American and Canadian engineers, estimates conference director R. A. Budenholzer.

Regarded as the largest meeting of its kind in the world, the conference is under the joint sponsorship of the Illinois Institute of Technology and 18 midwestern universities and professional societies.

To be presented at the conference are more than 60 papers covering 20 phases of production, transmission, and consumption of power. Among the subjects are: steam generation equipment, power system operation, industrial application of electrical energy, and gas turbine locomotives.

Approve Marshall Plan Funds

Washington — Recent approval of \$98 million in expenditures of Marshall Plan funds brought the total through March 12 to \$8.5 million. More than 29 pct of the total allocations to date have been approved for the United Kingdom. The dollar value is \$2.4 billion.

France has been the second largest recipient with more than \$1.7 billion and Italy stands third with nearly \$1 billion.

Included in the authorizations was \$16 million worth of purchases of machinery, equipment and vehicles.

Foresees Active Year Ahead

Pittsburgh — Despite adverse market conditions and intensive competition, the United Engineering and Foundry Co. foresees a year of high activity. Operations last year were at full capacity.

In its annual report for 1949 the company reported record breaking sales of \$63,281,618, as compared with \$52,473,267 in 1948. Net income was \$5,654,080, an increase of 12 pct over last year.



Steel Company Growth Data Seen Aid to Anti-Merger Bill

ILLETS AND

FORGINGS

FOR

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TENANCE

REQUIREMENTS

Washington-Data dealing with the merger expansion of 12 major steel producers is now under scrutiny by the House Small Business Committee. Prepared by the Department of Commerce, the data was turned over to the committee at a recent public hearing.

Committee chairman Rep. Patman, D., Tex., declared that the merger study would be "invaluable" in the Congressional preparation of anti-merger legislation. The study was presented by H. B. McCoy, director of the Office of Domestic Commerce, and Frank T. McCue, chief of the Iron and Steel Division of the ODC.

Westinghouse Stock Plan Filed

Pittsburgh-Employees of the Westinghouse Electric Corp. will gain an additional interest in the firm of 500,000 recently-issued shares of common stock at below market prices under a plan of continuous payroll deductions filed with the Washington, D. C., Securities and Exchange Commission. The current plan replaces one that terminated last November and resulted in the sale of 163,845 shares to 8928 employees at up to \$3 below the market price.

Payroll deductions under the new plan will continue automatically for 3 years or as long as shares are available. Stock will be issued every six months and sold at \$4 below market price.

Armco Raised Output in 1949

Middletown, Ohio-Armco Steel Corp., which expects to complete a new 400,000 ten openhearth shop here this year, reported 1949 net earnings of \$30,918,202 on net sales of \$341,350,147.

Capital expenditures for improvements and additions to facilities were \$22,032,888. Ingot capacity during the year was increased by completion of two new openhearth furnaces at Houston, making Armco's total capacity 3,131,020 tons of ingots annually.

has a SPECIAL meaning

HY-TEN Alloy Steels are steels with their own specific properties and definitely different chemistry from standard AISI and SAE steels. They are not AISI or SAE steels to which a trade name has been attached.

HY-TEN Steels offer the advantages of the latest metallurgical improvements before they are incorporated in the standard groups. The HY-TEN of today is the standard steel of tomorrow.

HY-TEN is a guarantee of uniform chemistry, grain size, hardenability, etc.

HY-TEN and STANDARD AISI and SAE Steels are stocked in a wide variety of sizes, shapes, treatments and finishes, thus assuring prompt reliable steel service from WL's seven warehouses.

Write today for your FREE COPY of the Wheelock, Lovejoy Data Book, indicating your title and company identification. It contains complete technical information on grades, applications, physical properties, tests, heat treating, etc.





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A. Tools are planned by engineers experienced not only in design but also in actual operating procedure.

B. Tools are constructed by craftsmen, under the eye of the designer.

C. Such a tooling set-up coordinates the best ideas of design, construction and operation . . .

blends technical and practical "know how" to produce tools of the highest quality for troublefree, un-interrupted stamping production.

As a result of this team-work, Presteel makes better tools which reflect a substantial saving in final stamping costs. Better tools mean better stampings!

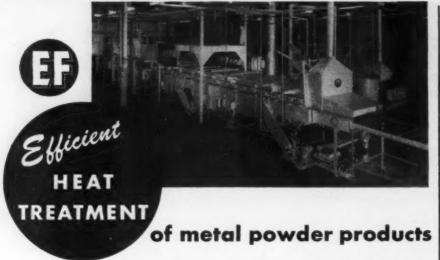
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ALLOY STEEL AND OTHER METALS COLD FASHIONED SINCE 1883



This combination gas-fired radiant tube and electrically heated continuous roller hearth furnace sinters molded metal powder products at 2050° F. It is 60 feet long and is equipped with an EF special atmosphere generator, dehydrator, and CO₂ removal unit.

Our wide experience, and complete line of production furnaces enables us to meet any requirement for ferrous and non-ferrous metal powder processing, fusing metal powders on strip and all other heating and heat treating operations.

More details on request.

THE ELECTRIC FURNACE CO.

GAS FIRED, OIL FIRED AND ELECTRIC FURNACES FOR ANY PROCESS, PRODUCT OR PRODUCTION

Salem - Ohio





Stockholders Report Shows 1949 Sales Level Down 23 Pct

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New York—A sign of the times was the 23 pct decline in sales recorded in 1949 from the American Brake Shoe Co.'s peak year in 1948. A decrease of \$28,456,204 from 1948 sales of \$120,190,784, largest ever in the company's history, was disclosed in the annual report to stockholders delivered by President William B. Given, Jr., last week.

An important factor in the decrease of shipments was "excess customer inventories," stated Mr. Given. Additional causes were reduced coal production, the steel strike, and curtailed railroad operations. Net earnings for the year were listed as \$3,987,844.

Barge Shipping Rates Lowered

Chicago — Downward revisions in rates for shipment of iron and steel articles by barge between Chicago and Texas and Louisiana points will be made by the John I. Hay Co., Chicago.

Included are a rate reduction of 13¢ a ton on shipments to Corpus Christi, Tex., made to meet competition of the government owned Federal Barge Lines. A new schedule of "uninsured" rates to New Orleans will be 9¢ a ton lower than standard rates. Substantial reductions in rates on iron and steel scrap from Texas and Louisiana to Chicago will also be made.

Italian Plant Buys Equipment

Washington — Marshall Plan purchase of \$12 million of American steel equipment by the Italian Finsider group has been approved by the ECA.

The bulk of new equipment will be shipped to the company's Cornigliano plant. The purchasing opened in Aug. '49, when the ECA also endorsed the purchase of \$3 million of mining equipment for three Sardinian coal mines in the Sulcis field. Modernization will enable the mines to produce a million tons.

Philadelphia Equipment Sales Estimate Is \$45 Million in 1950

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Philadelphia — Expenditures of \$45 million for equipment during 1950 are expected in this area as a result of a recent survey conducted by the Federal Reserve Bank of Philadelphia. The survey also revealed the following facts:

The Philadelphia manufacturing center is fighting for a more favorable competitive position with the recently equipped industrial centers of the West and South. Local manufacturers are therefore planning to spend more on equipment than on construction in the year to come. Emphasis is upon plant modernization rather than expansion.

Outlays for new plants in this area have reached a leveling-off point. The amount spent for construction in 1949 was \$43 million. This has dropped to an estimated \$39 million for 1950.

Equipment Outlays Lower

Readjustment in demand for new equipment has not yet been completed. This is revealed by the fact that outlays for equipment are apparently going to be about one-third less than last year. In actual figures, the Philadelphia expenditures for equipment in 1949 amounted to \$68 million. Proposed scheduling calls for \$45 million in 1950.

These estimates have enjoyed a high reliability. September 1948 predictions indicated an outlay of \$113 for equipment and construction for 1949. Actual figures amounted to \$111 million, which is within 2 pct of the estimate. Results have shown that the forecasts are good on the whole.

It was also pointed out that the Philadelphia figures could not be regarded as a reliable nationwide barometer. Manufacturing industries throughout the nation attain their peak dollar volume of capital expenditures in 1948. In Philadelphia the peak occurred a year earlier, and the rate of decline after that time was much sharper than that of the rest of the nation.

How well do you know your fire hazards?



How hard would one bad fire hit your plant and production? Where is it most likely to start? What is the key spot, which, if knocked out, would lose most time to put back in operation? Hundreds of industries who have faced up squarely to these questions have found that the only safe answer is complete protection for key hazards—and that such protection can best be supplied by Cardox and low-pressure carbon dioxide.

Cardox CO₂ means amazingly quick extinguishment, eliminating or reducing fire damage with no extinguishment damage. From single locations to complete plant systems, Cardox assures all the ${\rm CO_2}$ needed to put out the fire.

CARDOX — pioneers of low pressure carbon dioxide as an effective fire fighting medium—will welcome the opportunity to cooperate in a check-up that will reveal the danger spots in your operation—and familiarize you with the many fire-fighting advantages of "CARDOX" Low Pressure Carbon Dioxide Fire Extinguishing Systems*. Write for Bulletin 235.

*Covered by issued and pending patents.

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EXTINGUISHMENT

Cardox engineered applications give carbon dioxide enhanced effectiveness for faster, surer extinguishment of large or small fires, indeers or out.

PREVENTION

Cardox Atmosphere Inerting Systems provide law-cost inert gas for continuous fire and explosion protection.

DETECTION

Cardox Detection Systems, actuated by heat, smoke or flame, operate as a warning device or to actuate fire extinguishing system.



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Gear Unit Made <u>Better</u> ... but <u>Cheaper</u> with AMGEARS know-how

Wanted . . . constant mesh 3-speed divider and multiplier transmission for 28 hp.

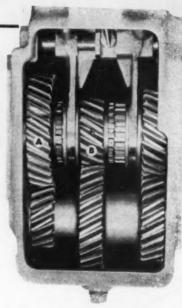
Supplied: Exceptionally compact unit with 2000 rpm. input, 3150 rpm. overdrive and 1060 rpm. underdrive output. Yet, no bronze bearings needed on A and B! WHY? Amgears designed the output shaft and gears A and B to rotate in same direction. Result, a relatively small difference in velocity between shaft and gear bores, with no load when velocity differences occur.

Save on *your* gear costs...improve your products...with AMGEARS design help as well as unparalleled gear manufacturing facilities. Write for interesting CASE HISTORIES.

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Production and precision spurs, sprockets, helicals, worms and wormgears; straight and spiral bevel gears and racks.





Claims Atomic Energy Won't Reduce Electricity Rates Much

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New York — Atomic energy is not a source of free electric power that will release mankind from toil and cure all its ills. This sentiment was expressed by Harry A. Winne, vice president of engineering policy of the General Electric Co. and chairman of its Nucleonics Committee, in a recent speech before the Detroit Rotary Club.

Atomic energy may become the source of vast amounts of electrical power, but it seems that the atomic reactor or "furnace," with some auxiliary equipment, will merely replace the fuel-fired boiler. From there on the atomic plant will be the same as one using coal or oil fuel.

May Compete With Coal or Oil

Although in the future it may compete with coal or oil there is no hope, he said, for really spectacular reductions in power costs by using atomic or nuclear energy. At present, fuel represents only about one fourth the cost of delivered electric power. Therefore, even if atomic fuel were free, this is the maximum reduction that could be expected. However, it will not be free and fixed operating costs of an atomic plant will doubtless be greater than one using coal or oil.

Mr. Winne stated that since nuclear fuel is such an extremely concentrated source of energy it is possible that atomic energy may bring cheap electrical power to areas where fuel transportation costs are high. This does not mean that small atomic plants will spring up in numerous isolated areas because such a plant must have an extremely large capacity to be efficient.

Within two or three years, he said, scientists and engineers of the Knolls Atomic Power Laboratory, which GE operates at Schenectady for the Atomic Energy Commission, expect to have a small experimental atomic power plant running. However, it will be many years before this evolves into a full scale plant, he added.

Stevens Tech Combines Tool Steel and Metallurgy Courses

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New York-A course in tool steels is being given for the first time in connection with the metallurgy program of the Industries Training School at Stevens Institute of Technology, Hoboken, N.J.

The course, which opened with the spring semester, deals with the required properties, composition and proper heat treatment of tool steels, and precautions taken to prevent warping and distortion. The processing and most suitable application of each type will be described in detail. Laboratory demonstrations and experiments will supplement the lectures.

Wing Mfg. Unites Activities

New York-On March 3, Wing Mfg. Co.'s three Newark factories and general executive offices in New York City were consolidated in a single modern factory building in Linden, N. J.

The main object of the consolidation was closer and more efficient interdepartmental cooperation. However, the modern office and factory building provides additional manufacturing facilities and adequate land for future growth.

Manufacturers of heating, ventilating and combustion equipment and steam turbines, the Wing Mfg. Co. sells its products through 70 offices in the United States and Canada. A New York City sales office will be continued.

Company Reports Progress

Cleveland-From the standpoint of broadening the scope of the business, more progress was made by the Cleveland Graphite Bronze Co. in 1949 than in any year, according to Ben F. Hopkins, chairman, and James L. Meyers, president of the company.

They reported 1949 net profits of the company at \$2,635,248, the third highest in the company's history. Sales in 1949 reached \$29,588,058.

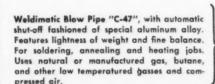
hatter welding costs WITH WELDIMATICS

Weldinatic Welding Torch "W-46", with built-in automatic Gasaver. Time study in auto plants showed an average gas savings per man of \$4.80 per day with this Weldit Torch. Weighs only 13 ounces. No operator's fatigue.



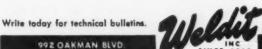
WELDIT GASAVER

... has been in continuous use throughout the world for over 20 years — slashing fuel costs, lessening fire hazards and improving safety conditions.





DETROIT 6. MICH



992 OAKMAN BLVD



Why not use Perforated Metal?

This Wesix Electric Heater shows a typical application of Hendrick Perforated Metal, combining utility and attractiveness. The heater guard is 20 gauge steel, with 3/16" x 11/2" side stagger perforations.

With facilities for producing any required shape and size of perforations in any commercially rolled metal, Hendrick invites inquiries from manufacturers who may be considering the use of perforated metal in connection with any of their products.



HENDRICK

Perforated Metals Perforated Metal Screens **Architectural Grilles** "Shur-Site" Treads and Armorgrids Manufacturing Company

Mitco Open Steel Flooring, 37 DUNDAFF STREET, CARBONDALE, PENNA.

Sales Offices In Principal Cities

Commerce Dept. Streamlines Industry Advisory Committees

Washington — The Commerce Dept. this week announced plans for streamlining its complicated network of industry advisory committees, starting with the steel and forest products industries.

The reorganization was ordered by Secretary Sawyer as a move to conserve the time of businessmen by eliminating duplicating or nonessential committees.

Abolish Some Committees

The new steel group has been tagged by the Commerce Dept. as the "Steel Products Industry Advisory Committee."

The membership is to consist of "a high-level executive group representative of the industry as regards size, geography and type of product, and including integrated and nonintegrated producers," according to the department.

Some existing committees will be abolished in the streamlining move, while others will be retained and strengthened. As a time-saving move, the Commerce Dept. will make industry committees available for consultation with other government agencies.

The department emphasized that disbanding of some committees did not imply that the government was less interested in industry advice than in the past. On the other hand, "our study of industry advisory committees will place our program of industry consultation on a more effective basis," it stated.

Under consideration for retention are committees representing the following industries:

Machine tools, industrial diamonds, diesel engines, anti-friction bearings, iron and steel scrap, power machinery and air conditioning and refrigeration equipment.



Post-War Inflation Here For Longer Stay, Reports Book

New York—Examining the financing of the five important wars in which the United States was involved, Roy A. Foulke, vice president of Dun & Bradstreet, Inc., concludes that the "inflation of World War II with its subtle devaluation may be somewhat more permanent" than similar periods following previous wars. Mr. Foulke's study, "Peaks and Valleys in Wholesale Prices and Business Failures," was published recently.

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In it, Mr. Foulke asserts that a factor of paramount importance to the "well-being of a business enterprise" is the level of raw material prices. He pointed out that the least number of business failures occurred in 1945 and that the trend since has been one of increase. With a return to a competitive economy, marginal enterprises which may have prospered in non-competitive times will be nudged into failure by inadequate planning of executive staffs.

Supports Free Scrap Market

New York—A plea for the restoration of free and competitive scrap markets in the best interests of the steel industry was made by Benjamin Schwartz of the Benjamin Schwartz Co., New York, at the Founders Dinner of the New York chapter of the Institute of Scrap Iron & Steel held here recently.

In discussing the functions of a free market he stated that direct dealing and other practices have resulted in a new pattern of buying scrap which may harm the independent scrap dealer. He called for the elimination of unfair trade practices, particularly in connection with the deterioration of scrap quality, by the adoption of a code of standards.

Stanley Kaplan of the M. S. Kaplan Co., Chicago, national president of the institute, also spoke on current problems of the industry.

· News of Industry ·

Studebaker, Mercury, Nash, Cadillac Top Grand Canyon Run

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Detroit—Results of the Mobilgas Grand Canyon Economy Run in which 31 stock passenger automobiles participated show that Studebaker, Mercury, Nash and Cadillac ran off with the top honors.

The course traveled was 751 miles long. At one time it dipped 178 ft below sea level and another time was 7005 ft above sea level.

Official results are computed in ton miles per gal including the weight of the car and passengers.

	Miles Ton miles	
	per gal.	per gal.
Studebaker Champion	26.55	51.83
Mercury	26.52	61.27
Nash Ambassador	26.42	58.46
Willys Jeepster	26.09	44.30
Nash Statesman	25.52	51.36
Studebaker Land Cruiser	24.88	55.68
Kaiser Virginian	23.96	55.77
Kaiser Special	23.94	53.04
Frazer Manhattan	23.90	54.33
Studebaker Commander	23.79	52.64
Hudson Pacemaker	22.59	52.25
Ford Six	23.32	48.57
Cadillac 61	22.97	58.52
Cadillac 62	22.52	58.56
Cadillac 60	22.08	59.11
Hudson Commodore	21.38	52.28
Dodge	21.38	47.36
Plymouth	21.25	43.83
Chevrolet	21.07	44.03
Oldsmobile 88	20.19	47.60

Some carmakers did not enter the contest. These included Buick, Pontiac, Ford V-8 and the Hudson Super Six.

Most observers agree that the Grand Canyon Run is probably as much an exhibition of driver's skill as it is a true test of economical performance of the car.

Soviet Cuts Out Shipments Of Chrome, Manganese to U.S.

Washington—Neither manganese nor chrome ore was included in the \$2.4 million worth of goods imported from Russia during January. About \$1.8 million of the total consisted of furs and manufactures.

For the same month, this country shipped less than \$50,000 worth of goods to Russia as against a monthly average of \$2.3 million in 1948 and \$600,000 last year.

Kester Solder



Kester engineers, with over 100,000 different types and sizes of solder available, will specify the right flux-core solder that will give maximum efficiency and economy to the job.

Easier to Use

Using the most suitable solder for each operation will enable solderers to work at top speed without sacrificing quality. Waste is eliminated and rejects are held to a minimum.

Top Quality

Kester Solders are made only from newly mined grade A tin and virgin lead. Fluxes—chemically and scientifically correct.

KESTER SOLDER COMPANY

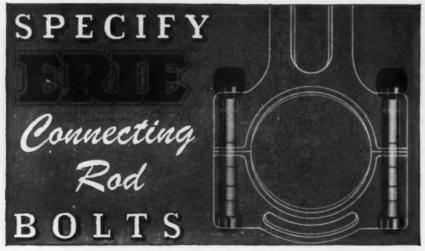
4201 Wrightwood Ave. • Chicago 39, Illinois Newark, New Jersey • Brantford, Canada

Send for free manual, "SOLDER and Soldering Technique."

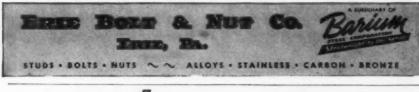
> KESTER SOLDER

Standard for Industry since 1899





Send your specifications for precision bolting to better, headquarters for special bolting since 1913. This long experience with alloys, steels, latest heat treatment and most rigid machining and threading tolerances is at your service. It pays to entrust vital bolting to folks who do this kind of work day in and day out. Hundreds of heavy machinery manufacturers like to do business with try for your next special bolting requirement.





Kaiser Steel Corp. Produces \$100 Million in Steel Per Year

Oakland, Calif.-Kaiser Steel Corp. at Fontana, Calif., is producing steel with a sales value of more than \$100 million per year, according to a book just released which for the first time presents a comprehensive picture of all the 16 varied Kaiser directed enterprises. According to this report there are 141 products produced by 44 Kaiser plants in the country which have a total sales value of \$½ billion per year; with payrolls exceeding \$128 million; employing more than 46,000 persons and purchasing material in excess of \$60 million.

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Products of this organization range from aluminum, steel, automobiles, and pressed metal products, to paving materials and refractories. From the end of the war through 1949 these 16 industries turned out goods and services with a gross value of \$11/2 billion which included: 776,000,-000 lbs of aluminum; 166,190,177 sq ft of lath; 14,848,647 tons of sand and gravel; 2,090,838 tons of steel; 21,571,654 barrels of cement; nearly 400,000 automobiles and 1,204,655 tons of chemicals. This report states that the Kaiser steel plant at Fontana is capable of producing more than 1 million tons of ingots per year; coke ovens turn out more than 42,000 tons of coke monthly and large amounts of chemicals. Aluminum production of the Kaiser Aluminum & Chemical Corp. is reported as being one fifth of the nation's primary aluminum production which is more than the entire output of the country up to 1937.

Cuban Group Purchases 300 General Motors Coaches

Detroit — A fleet of 300 GM coaches has been purchased by the Bus Operators' Cooperativa, Havana, Cuba. Value of the order is in excess of \$3,500,000 and is evenly divided between heavy and light duty vehicles. The 150 heavy duty coaches will be powered by GM 2-cycle Diesel engines.

· News of Industry ·

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turning out finished components and machinery. Plant 1 of the Lukenweld Div., the nation's first commercial arc and machine weldery to specialize in design engineering, came into existence in 1930.

A plethora of World War II contracts for Navy diesels resulted in the building of plant 2 by the War Assets Administration. It was added to the Lukens family with its purchase in 1947.

Seeking New Markets

At war's end Navy contracts halted and a letter was circulated to employees asking for cooperation in the maintenance of Lukens quality so that the company could wedge itself into the peace-time market. Employment hinged on the success of the enterprise, the letter indicated.

Lukens then took energetic strides in making itself a contender for the industrial plums of machinery finishing. Created to serve all divisions were the Development Engineering Div., the Research Dept., and the Markets Development Dept., the spearheads for the Lukens era of specialties.

Lukenweld continued to build cylinder blocks and bases for diesels, gas, and steam engines. It made underframes for railroad cars, housing for machinery, huge welded vats, truck bodies, the important jacketed drier rolls for paper making, and a hundred other items down to doughnut cooker units.

Pushing Flat Welding

The costly and time-consuming vertical and overhead arc welding with coated wire is disregarded in Lukenweld in favor of flat welding with Murex wrapped electrodes. Cranes are used to flop and tilt machinery to flat welding positions. This has cut an inestimable number of man hours from job time.

Lukenweld welders can pour metal into joints and butts with



The New ACCO Sling Chain Adjuster

-a Safety Measure and a Work Saver

• It comes as a complete unit—Pear Shaped Link, Adjuster and Single Sling with hooks at both ends. Slings of "85" and "125" ENDWELDUR steel chain—from ½" to %"—Link and Adjuster sized to correspond to size of chain. Length of chain to your specification.

Your AMERICAN CHAIN distributor can give you detailed information—capacities, recommended sizes, prices, etc.



In Business for Your Safety



CONTROL" WHICH GIVES A 10% SAWING BONUS

Capewell's exclusive "Statistical Quality Control" during manufacture assures a bonus of 10% additional cutting because it raises standards and eliminates substandard blades.

Another Capewell Exclusive "BLADE SELECTOR"

> Stamped on every Capewell hack saw blade, it enables user to choose blade with proper number of teeth for a particular job.

THE CAPEWELL MFG. CO. DEPT. 73, HARTFORD 2, CONN.

News of Industry .

the fast-flowing Murex wire instead of painstakingly and slowly weaving a vertical upward or whipping an overhead. Flat welding cuts down worker instruction time and even in semi-skilled hands a weld will not go amiss. The chances for slag flaws in the weld are lessened because the Lukenweld electrode burns fast and hot.

The incursions of Lukens as a builder of machines for various industries have been many. Booklets are prepared to show the soap industry, the textile industry, the petroleum industry, and others what Lukens can build for them. A regular publication, Lukens Plate, lists regularly the products and innovations of the company.

Lukens Had Pensions Early

Amidst all its striving for a better position in industry, Lukens has continued its tradition of protecting the worker. The men remember that Lukens started a non-contributory pension plan in 1919 when Michael McMahon, 77 years old, went on the roster with \$30 a month for life. Edward Gilbert, now 95 years old, was pensioned in 1934 with \$40 for life. Those were pre-inflationary dollars.

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Silver-haired George K. Irwin, Lukens' director of personnel, helped organize an employees' cooperative store in 1920 with the company's blessing. He remembers signing welfare orders for food during the depression and during the 35 day pension strike last October. More than \$7000 in food was distributed to the striking workers on trust. Of that \$15 remains to be deducted from pay checks.

Long Service Stressed

On holidays, Mr. Irwin makes the rounds to the needy with company baskets. He knows many of the workers by first name and when they are ill company flowers and wishes for a quick recovery are sent. Mr. Irwin is one of Lukens' higher echelon men who keep in touch with the men at the grass-

A company-sponsored club, the

Ask Your

Distributor about:

Capewell hack saw blades, hack

saw frames, band saws, Dafiles,

spiral saws, band saw machines,

ground flat stock, hammers.

News of Industry

Lukens Veterans Guild, has a membership of more than 1000 employees with 20 years of service. In company brochures and advertisements Lukens stresses a selling point—its men ever-gathering skill stick with them. The average service of flanging department men is better than 30 years. You can trust this group of veterans with your orders, Lukens says.

Ranks Well in Safety

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Lukens is in the front ranks of safety, having 4.19 accidents for each million man hours as compared with 5.86 for industry as a whole in 1949. The safety campaign is constant and unrelenting and blunt. Foremen take courses not only in the psychology of worker treatment but in his safety. Lukens Suggestion System pays cash rewards for safety ideas as well as thoughts on production.

Management takes the time to mail each worker periodically letters on the company's state and problems. A plea for continuance of quality work instills pride in addition to maintaining production. Courses in technical subjects are sponsored for employees as well as supervisors. Lukens Life, the company newspaper, carries plant news and gives plaudits for service and performance. It has saturation circulation. A \$4000 scholarship in engineering is awarded annually to a Coatesville high school senior.

Iron Age Interviews Men

THE IRON AGE selected and interviewed 20 men and all had something favorable to say about the company. An outcropping of minor complaint came from two who said they were inconvenienced by the 4-12 p.m. shift.

Flanger Robert Patton, 38, of Coatesville, with 17 years service and twice a grandfather, said that he always received fair treatment from the company. Herman C. Weaver, 65, with 23 years service, a hydraulic press operator, thought that the \$2 million installation of GE motors to power the big mill meant job security for the future. Mr. Weaver has two sons in



A NEW HATOWELL TIME-SAVER

The sturdy, easy-rolling CARRY-TOOL is the handiest, time-saving "carrier" in the shop. Made of heavy-gauge steel, the CARRY-TOOL has large drawers that hold a full complement of tools. Ball-bearing rollers make drawers slide easily, loaded or empty. Padlock attachments protect contents. Use the CARRY-TOOL on assembly lines, at machines, in the tool room. "CARRY-TOOL takes the tools to the job—therefore, a step-saver." Full details in Bulletin 715.

See us at Booths 128 to 138 inclusive, A.S.T.E. Exposition, April 10-14, Convention Hall, Phila.

SHOP EQUIPMENT HALLOWELL

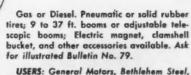
STANDARD PRESSED STEEL CO.

JENKINTOWN 17, PENNSYLVANIA

KRANE KAR Loads and Unloads freight cars, trucks, trailers; Stores materials; expedites Plant Maintenance. Often cuts cost of handling loads to 8c a ton.

No Mobile Crane made today can match KRANE KAR speed, safety, and economy of operation... picking up, carrying, and placing loads . . . anywhere, in plant or yard . . . uneven terrain, congested areas, low overhead, up and down ramps.

IKIRANIE IKANR MOVES LOADS EASIER - FASTER -SLASHES COST OF MATERIALS HANDLING



USERS: General Motors, Bethlehem Steel, Boeing, Pullman-Standard, Lima Locomotive, Carnegie-Illinois, U.S. Steel, Basic Magne-

THE ORIGINAL SWING-BOOM MOBILE CRANE
WITH PROMI-WHEEL DRIVE AND REAR-WHEEL STEER
11/4, 21/4, 5, AND 10 FON CAPACITIES

AND TO TON CAPACITIES

AND TO TON CAPACITIES

AND TO TON CAPACITIES

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AND TO T KRANE KAR handles loads at Sides as well as at Front.

SILENT HOIST & CRANE CO., 851 63rd St., BKLYN 20, N.Y.

March 30, 1950

ARMSTRONG Carbide TOOL HOLDERS



ARMSTRONG Carbide Tool Holders and ARMIDE (Carbide

Tipped) Cutters come in cased sets for tool rooms and maintenance departments, and individually in all sizes for general machine shop and production turning. They permit not only the ready machining of sand-filled castings, the hardest and toughest steels as well as many heretofore "unmachineable" materials, but also make practical much heavier cuts and cutting speeds up to 600 f.p.m. on ordinary work. They also run from 10 to 100 times as long between regrindings.

Write for Catalog



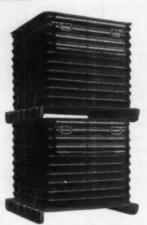
ARMSTRONG BROS. TOOL CO.

"The Tool Holder People"

5209 WEST ARMSTRONG AVE., CHICAGO 30, ILLINOIS
NEW YORK SAN FRANCISCO

ANOTHER TIME-SAVING COST-CUTTING ALL-STEEL MATERIALS HANDLING BOX DESIGNED and BUILT BY POWELL

Materials handling jobs require individual attention. Powell specializes in special as well as standardized equipment. The pictured Hinged End Door Box Platform was recently delivered to a customer who wanted a stacking box that was easy to work out of even when stacked. The box had to be easy to get to with fork lift trucks yet—to facilitate tiering — have a minimum fork space. Powell met every requirement satisfactorily.



POWELL PRESSED STEEL



Since 1920

Powell designs and builds all kinds of materials handling containers from any metal. If you are not certain you are handling your product economically—call in Powell—originator of cold formed steel materials handling equipment. Bulletin 700 indicates Powell versatility in creating special equipment. Write for it.

DEPT. 43-A

POWELL PRESSED STEEL CO.
HUBBARD, OHIO (IN GREATER YOUNGSTOWN)

· News of Industry

Lukens service, Donald and Burton.

Herbert Brown, a shears operator, with the firm since 1928, said that he had no complaints and that practically all the men in his circle either worked for Lukens or hoped to. There was an absence of malice for the company in all replies.

First vice president Charles Lukens Huston once epitomized the Lukens policy toward labor in a statement: "Treat all men fairly and in person. Live with the work and the workmen. Pay honest wages for honest work—and pay those wages at the time they are earned. Pay for everything that is earned."

Mr. Huston, who has been with the company for 75 years, said that many years ago. The spirit has endured.

Resume Your Reading on Page 120

Average Factory Worker Aided by 13 Electrical 'Men'

New York — Electrical energy has provided the average U. S. factory worker with the equivalent of 13 full-time assistants to help him earn his daily bread, says E. C. Brodin, director of manufacturing research for SKF Industries, Inc.

It's a matter of horsepower as well as manpower, according to Mr. Brodin. American factories have an installed horsepower of 18,000,000, and there are 14,000,000 industrial workers in the country. Since one horsepower is mathematically equivalent to ten working men, that gives the average man at the machine the aid of 13 other "men."

B. & O. Freight Revenues Drop

Baltimore—The Baltimore and Ohio Railroad lost an estimated 133,000 carloads of freight in 1949 because of work stoppages in the coal and steel industries. This was revealed in B & O's Annual Report for 1949.

Freight revenues declined by \$39,728,935 from the previous year. Net income was \$6,869,827, or \$15,288,468 less than in 1948.



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GE

UNIFORM **METAL PARTS**

Our experienced craftsmen take pride in producing uniform stampings of the highest quality material. Your specifications carefully followed. Send blueprints or samples for quotation.

WORCESTER STAMPED METAL CO.

Established 1883

10 HUNT STREET • WORCESTER, MASS.

• Erie Strayer-Electric buckets either AC or DC are standardized in 7 sizes 1/2 thru 2 cu. yard capacities. Motor in bucket head controlled by man in crane cab—Bucket hooks-on for intermittent bucket and crane hook work. Write for details. Address 803 GEIST RD.



ERIE STEEL CONSTRUCTION CO . ERIE, PA.

AggreMeters · Buckets · Concrete Plants · Traveling Cranes

25 TO 40 TON CAPACITY



THE OHIO LOCOMOTIVE CRANE CO BUCYRUS, OHIO



STEEL TOOL Punches, Dies, Chisels, Rivet Sets 660 E. 82º St. Cleveland, O. If it's RIVETED you KNOW it's safe



UNDT & SONS



* Bring Your Samples to ... **ASTE SHOW BOOTH 106**

where we will be demonstrating the

STONE METAL CUT-OFF MACHINE

★ Greater Capacity

Cuts up to 3" solids and 4" pipe

* Faster Cutting

Cuts any metal in seconds.

★ Flexible

Cuts any angle from straight to 46° in quick change, self centering vise.

* Easier Operation

Less operator fatigue — more operator confidence.

Low Price

Offers you much more cutting capacity per dol-lar than any other abra-sive cut-off machine.

If you miss this demonstration at the show, write for further information to:

STONE MACHINERY CO., INC. 404 Fayette St. Manlius, N. Y.

In 2 Modern Plants ALCOA MAKES

the best aluminum

DIE CASTINGS

you can buy...



Your phone book lists the nearest Alcoa sales office under "aluminum". For prompt quotation, technical book and help based on 62 years of aluminum knowledge . . . call there or write ALUMINUM COMPANY OF AMERICA, 1901Q Gulf Building, Pittsburgh 19, Penna.

ALCOA Cluminum DIE CASTINGS





SCREW MACHINES

Nat'i Aemo RA 9/16" apdle. 6, 2985 max. rpm., teeling & attachments (very late)

Potter & Johnston & SDRE Auto, chucker 34" swing, 5 fase turret. Timksm bearing, tooling.

Cloveland 334" and model "A" agl. spdl. auto. serew, quantity of tooling (very late).

BORING MILLS

Universal 4" bar "Tri-Way", face plats to outer support 72", #6 taper, added vertical range (late). Defiance 25A, 394" bar, face plate to exter support 102", #6 taper, added vertical and cross range (late).

Lucas #41, 3" bar, face to outer support 72", #5 taper

Bullard 24" and 36", "spiral drive" 24", 39" and 42", "New Era" type vertical. 3-jaw and 4-jaw chuck tables. Botts 16' M.D., D.C. vertical, 2 swivel heads on cross rail, rapid traw, elec. comtrol complete.

VERTICAL MILLERS

Brewn & Sharpe #2 Lite type, wkg. table 45" x 10", range 20" x 10" x 10" (late).

Milwaukee #2K and #3K High speed (very late). Ingersell 18" x 12', 2 spdl. openside planer, type keyway and spline, A.C. M.D.

Brown & Sharpe #2 Standard, wkg. surface thi. 45" x 14", range 28" x 14" x 14", 1200 rpm. max. speed, (late).

UNIVERSAL MILLERS

Van Norman #25U Horiz. Knee type, wkg. tbl. 50" x 12", range 24%" x 10" x 17" (very late).

Cims. IM Motor-in-base, wkg. tbl. 40" x 101/2", range 22" x 8" x 18", attahmts.

Brown & Sharpe #3A, motor-in-base, wkg. tbl. 58" x 114", range 29%" x 12" x 19".

This is Only a Partial Listing Send for Our Catalog



GRINDERS

No. 3 Cincinnati Centerless. 12" x 24" Cincinnati Universal. 4" x 12" Landis Plain. No. 5 B. & S. 3" x 18" Cylindrical. No. 5 Bryant Internal. 6" x 18" Norton Surface.

MACHINE TOOLS AIR COMPRESSORS **MOTORS & GENERATORS** WELDERS

DELTA EQUIPMENT CO.

148 N. 3d St.

Phila. 6. Pa.

Metal Forming and Bending Machine Lees-Bradner CT 36" Thread Millers (2) 12 Sp. Automatic Indexing Drill Crankshaft Grinder, 10" x 48"

CONTINENTAL SALVAGE & MACHINERY CORP.
Ave. Cleveland 15, Ohio 1836 Euclid Ave.

THE CLEARING HOUSE

NEWS OF USED, REBUILT AND SURPLUS MACHINERY

Chicago MDNA chapter hears talk on how to sell used machinery to Europe

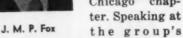
Small tool-jobbing shops set up operations in Newark area

National Assn. of Manufacturers speaker addresses Philadelphia NISA meeting

Fox Tells How to Sell Used **Machinery to Marshall Nations**

Chicago-There is no important difference between selling to Europe under the Marshall Plan and

normal export selling, J. M. P. Fox, executive director of the Machinery Dealers National Assn., told members of its Chicago chapter. Speaking at



March 16 meeting, Mr. Fox summarized discussions and correspondence he has had with various ECA and other government officials regarding selling used machinery to Marshall Plan nations.

Hoffman Interested in Problem

One of those most actively interested in the problem, Mr. Fox said, is Paul Hoffman, ECA head, who was once associated with a firm in the used machinery field. The ECA favors full consideration of used machinery in recovery program, Mr. Fox said. However, the ECA's role in promoting world recovery is primarily to act as a banker, furnishing dollars for purchases in this country which otherwise could not be made because of currency convertability restrictions.

The selling job must be done to the individual European buyers, and to the officials of their governments who have the say in allocations of ECA dollar funds. Much prejudice among European buyers must be overcome, Mr. Fox indicated. They fear U.S. dumping of machinery unsalable in this

Some also believe that the U.S. wants them to set up production lines with overage equipment so that products turned out will be unable to compete with mass produced American products. Mr. Fox cited the example of the Italian government, which has imposed severe restrictions on imports of used machinery.

Sales Representatives Urged

The recommendations of government officials and exporters in touch with the situation indicate the desirability of having sales representatives on the spot in Europe, Mr. Fox said. In the event that individual firms or groups cannot afford to obtain such representation, he suggested that the MDNA might consider taking the

Examples of the work already being done by the MDNA executive office, Mr. Fox said, are the lists of European buyers and officials that are being obtained for member dealers. He also pointed out that a high ECA official will speak at the forthcoming MDNA convention in Detroit.

Newark Inquiries Strong; Sales Reported Fair to Good

Newark-Used machinery business in this area is reported to range from fair to good. Most dealers report their sales activity level is 10 to 20 pct higher than

Turn to Page 242

AARON FOR RELIABILITY

AUTOMATICS Brown & Sharps #80G, H.S. #4 & 6 Brown & Sharps #2G, 1½" cap. Commatic 8 ap. 1½" cap. Now Britzia Gridisy 61—2½" 6 ap. Caco %" Swiss type

BORING MILLS
Gliddings & Lewis #0, #25T
Lusas #31 heriz.
Universal #" horiz. equipped
Bullard 42" V.T.L.

DRILLS AND RADIALS Alion 6 spindle Cimel-Blekford Sup. Ser. 21" Reyersford Excelsior 21" Camedy-Otto 3'-9" sol. Cariton 8'-19" sol. Sibley 24" & 28"

ENGRAVERS Gorton #3U, 2 dimensional Gorton Cutter Grinders 375-2, 265-6 Decket GKI 3 Dimensional

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GEAR EQUIPMENT Barber-Column #3 Holbers (3) Glesson 3" Generator the Hamilton Hobber Fellows 645Y, #7, #72 #725 High Speed Shapers Mikron Goor Hobber Fellows, Michigan, Glesson Chockers

GRINDERS, MISCELLANEOUS RINDERS, MISCELLANE, OUS
Brewn & Sharpe \$1, \$2, \$3 Univ. \$13 Tool
Oiselnanti \$2 Center-tess Filmatie, 12 x 38 Univ.
Cinelinanti \$2 Center-tess Filmatie, 12 x 38 Univ.
Cinelinanti \$2 Tool & Cutter, univ.
Cinelinanti \$2 Tool & Cutter, univ.
Covel \$91A Univ. Tool & Cutter, Hammond \$4
Heeld 72A3 Int. Centeriess Sizematie, \$1 Tool
J. & L. TG886 Thread Grinder
Landis \$4H Cyl. 4x12", Centeriese, \$6 Thread
Nories \$2 Tool & Gutter, Type C, &x50"
Oliver \$510 Orliver Sollers 4G, Blask D'men#
Pratt & Whitney Radius \$48, K.O. Lee Tool
Perter Cable Belt WG8, G8; Grenby Int.

GRINDERS, SURFACE
Abrasive \$38, 8:24", \$33, \$34 Vert.
Blanchard \$16, 39" Mag. Chuek, \$11—18" chuek
Brown & Sharpe \$2
G. & L. \$25, \$35 Hyd. Feed, 6 x 18, 8 x 24





Bliss 406-48" Dbl. Crank, Dbl. Action Toggle Press

Hamehett 300 series, i3x48" with chuck, Hammond #2 Norton &xi5" Hyd., Atlantic 0x18" Power Feed Rold #2A P.F. Mills., #2C Pope Spdll. Pratt & Whitney i2x36" Vert. Thompson Hyd. &xi0x18", @xi2x18"

LATHES ATHES
Hardinge Precision 9", 1" Colist Cap., Rivett
Hendey G.H., 19x30", Rel. Att. Bradferd 14"x0"
LeBleon Regal 15x30", 21x00", 10"x33", 19x40"
LeBleon Heavy Duty 16x33"
Lodge & Shipley 16x78" T.A., Collets, etc.
Menarch 10"x20" Es. 18x78 G.H., 12x30"
Sebastian 12"x4" G.H.
Sholdon 11"x24", Logan 10"x30"
Seuth Bend 13x30", 14½"x6", 10x4, 9x3, 9x3½

MILLS, PLAIN, UNIVERSAL &

ROD.

Brown & Sharpe #000, 12, 21, #2A Univ., 2B PL.

Burks #4 Plain & Univ. Vert. Hd.

Circinnati 2MH Univ.,—1-12, 1-18, 2-18 Mfg.

Kent Owens #1V; U.S. Hand Mills.

Miltsauke #2HL, 2H Univ., 2H Plain

U. S. Muttimilier

U. S. Muttimilier

Van Nerman #12, 22L, 36; U. S. 1 & 2 sp.

MILLS, VERTICAL MILLS, VERTICAL
Bridgsport Vert. Slotter, Her. Sp.
Brown & Sharpe #2
Cinelinati #4
Feaflek lig Berer #42A. HD. Equipped
Gartos #80, 9J Plain, 8½D Duplicator
Slp Jig Berer #MP-5
Indax, Jackson, Vernon
Milwaukee 3H. H.S.D.T.
Morey #12M Profiler 2 sp., P. & W. 12B

PRESSES Bliss 675, 650, 845B Hi-Production Presses Bliss #8 Dbl. Crank, Bed 42"x98" Bliss #8 Dbl. Crank, Bed 42"x98" Bliss #4½ Double Action, Roll Feeds HYDRAULIC EQUIPMENT

| Cap. | Manufacturer | Plates | Stroke | Opening | Southwark | 42x32" | 23" | 68" | 68" | 690 | 690 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 | 691 |
 Manufacturer
 Platen
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 Opening

 Southwark
 42x32"
 28"
 68"

 Lake Erie
 35x36"
 36"
 06"

 Bald.S'thw'k
 76x59"
 22"
 30"

 H.P.M.
 36x36"
 24"
 30"

UP MOVING RAM PRESSES

OF MUTING RAM PRESSES
150 and 100 Ton Stokes Molding Presses & Pumpa
300 Ton Dunning & Boschert Molding Press
500, 800 Ton Waterbury-Farrel 3 & 4 Rod
Presses, 6 & 8/2 strokes
300 Ton Watson Stillman Press, 2420° Platens
500 Ton Watson Stillman Press, 2420° Platens
500 Ton Shart Straightners—Self Contained
All Hydraulic Equipment is completely engineered and checked by a competent staf,
thus assuring reliability. Send us your
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NEW IN STOCK

AIF Hydraulis Presses—Arbor Presses #8C Famee
—Band Saws Kalamazeo—Drill Presses all sizes
—Hydraulis Press Northers 20 Ten—Injectie
Melders, I ounce—Pewer Presses, OBI, 4/2, 5,
7/2, 10, 12, 18, 30 ton—Shaper, 7" Ames, 8"
Shaperite—Shaper, Sheidon 12"—Shears, Foot 22"
to 8', 16 & 18 ga.—Shars, Power, 3"x18 gauge to
10"x19 ga.—Welders, Arc. Seam, Spet all sizes—
Vort. Milling Attack, Hales H.S.—Meters, Grimders, Buffers, all sizes.

Henry & Wright 75 Ten Dieing, 25 Ten Z & H 30 Ten OBi Telede 400 Ten Knuckle Joint V. & O. #102 O.B.I. Redusing

TURRET LATHES

ORREI LATRES
Acme 26W Bar & Chuck, Acme 8W Fox, 4W
Bardens & Oliver 33, 1½" cap., 35, 2" cap.
Brown & Sharps 21, 27, Hand
Gisholt 24, 5 Bar & Chuck, 11, Foster 23B
Hardings ESM Second Operation
J. & L. &A.—Well Tooled
Oster 2801 Rapiduction, well tooled
Warner & Swassy 25, 4, 3, Universal
Warner & Swassy 24A, 2" cap. Power Chucks (2)

MISCELLANEOUS

MISCELLANEOUS
Band Saw: Tannewitz #36M, DoAll ML, V16
Bending Rell; Buffalo #0, ½WR. Excelsior #14
Broach; American Heelz. Hyd. Model H-15-80
Hacksaw; Marvel 6A Automatic #6
Hardness Tester; Clark
Hone: Micromatic #H-1, Sunnen
Keynester; Davis, Baker, M & M
Rivetera: HI Speed
Reuter; Ogsrud #W240, 55
Saws: Wells, Catskill, Peeriess, Kalamazoo
Slotter; P. & W. 6" Vert. Shaper
Shaper; #5 Shaperite, 7" Atlas
Shaper: Patte #714 Ga.
Tappers; Bakewell #1, Haskins #20, 3C
Welders; Seam & Spot; Thompsen, Taylor-Winfield,
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FOR SALE

I—ROCKFORD Oscillating HOE and SHOVEL Rolling mill with 25Hp Slip Ring Motor. This machine has been completely overhauled.

I—AJAX #IA Taper Forging Rolls -arranged for motor drive.

VINCE SWORD CO.

1323 East 4th St.

LATHE—BRIDGEFORD, 32" x 21" C. to C. (old)
LATHE—GUN BORING, 64" x 65" (late)
PLANER—GRAY, 65" x 66" x 46" (Tolerance .003)
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SHEAR—R. D. Wood, 7" x 1", 18" gap

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Ohio horizontal planer type 5" spindle. Table 42" x 126". Table feed 96". Vertical travel 48".

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AIR COMPRESSOR

1000 Cu. Ft. Worthington "Feather Valve,"
18" x 11" x 14" two stage with 185 HP synchronous motor on shaft.

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4%" Conomatic 4 spindle, serial No. 2191K with, reel, chip conveyor, extra equipment.

BORING MILLS

4½ bar Lucas No. 33. Table 46" x 64" Max. height 36", Max. to outboard sup-

100" Niles Bement Pond. Extra heavy type. 2 swivel heads, power rapid traverse, 35 HP direct current motor.

BROACH

15 ton 36" stroke American vertical duplex surface with tilting type workholder.

DRILL

42 spindle, No. B16 Natco multiple with 18" x 48" drilling area and two box tables.

GEAR HOBBER

Type T Barber Colman. Designed for either straight or taper splines, helical or spur gears. Also type A and Nos. 3 & 12 Barber Colmans.

GRINDERS

6" x 18", No. 10 Brown & Sharpe "Elec-tric Hydraulic" Three with and two without spindle oscillation. New 1940 and

10" x 36" Norton type C hydraulic with hydraulic quick in-feed. Serial No. C16458, new in 1942.

10" x 72" Norton type C hydraulic made at factory to swing 14". Serial No. 21750, new in 1944.

23" x 36" Norton type C with mechanical table traverse, hydraulic quick in-feed. Serial No. C18281, new 1943.

LATHE TURRET

No. 2FU Foster Fastermatic Serial No. 2FU529, new in 1944. Quite a little tooling.

MILLERS

Cincinnati Hydromatic Sizes: 3-24, 34-36, 4-36, 4-48, 5-48, 56-72 and 56-90.

PRESSES

1000 ton, No. 666 Toledo knuckle joint Coining. 21/2" stroke, 18" shut height, bed 37" F to B x 31" R to L.

350 ton Clearing Crankless, F1350-42, serial No. 45-11155P, new 1945. 20" stroke, 28" shut height, 36" x 42" bed.

600 ton Hamilton No. 23161/2 eccentric shaft forging. Stroke 4"; shut height 16", bed 28" F to B x 23¾" R to L.

No. 506 Bliss on inclined legs with double roll feed and scrap cutter. About 126 tons. 3" stroke, 111/2" shut height.

1000 ton Baldwin Southwark "Hy-Speed" hydraulic. 20" stroke, 56" daylight, bed 42" F to B x 54" R to L.

UPSETTERS

2" National. Serial No. 13213. Has suspended slides with long overarm guide. Has 15 HP motor.

4" Ajax. Serial No. 3156. Has twin drive gears, suspended slides, self contained backshaft, 30 HP motor.

MILES MACHINERY CO. SAGINAW, MICH.

Continued from Page 238

that of the first of the year. One dealer reports that his activity is 35 pct higher. There has been a slight slowdown in sales during the past 3 weeks. In spite of this, dealers report that inquiries are very strong.

The only thing standing in the way of consummating more sales is the fact that quite a few of the machines asked for are not available. Dealers who are lucky enough to have a source of supply of late type equipment are the one's reporting the highest rate of activity. One of the best sources of good equipment is said to be the plant that is being liquidated.

New Jobbing Shops Started

With regard to who is buying, no definite trend is indicated. Most dealers report that they sell to both large and small firms. A few say the small shop buyer is again a fair source of business. One optimistic dealer told of three small tool jobbing shops that have recently set up operations.

The production units seem to be getting the most play at this time. Demand is strong for large lathes, automatic screw machines, drill presses and grinders. There is also some activity in shapers and both light and medium presses. One dealer reports that at present he is negotiating the sale of a \$75,000 draw bench.

NISA Chapter Hears NAM Speaker

Philadelphia - Dr. Neal Bowman of the National Assn. of Manufacturers addressed the Quaker City chapter of the National Industrial Service Assn. at its local meeting held at the Garden Court restaurant on Wednesday, Mar. 8.

Pres. Joseph H. Previty presided and introduced Dr. Bowman who spoke on the topic: Selling America. Other business covered included plans for holding a ladies' night with entertainment in conjunction with seating of new officers. It was announced that the next meeing will be held in the same location on April 12.

Resume Your Reading on Page 239

Upsetting & Forg. Machs., National High Duty,

guided overarm heading slide, suspended slides, 1½", 2", 3", 4", 5"

Ajax & Acme Upsetting & Forg. Machs., not suspended slides, 34", 1", 1½", 2½", 3"

W. W. Bulldozers, #22, #4, #24, #5, #8

Drop Hammers, 800# to 2500#

Nazel Air Forg. Hammer #48. Can 7" for

Nazel Air Forg. Hammer, #6B, Cap. 7" sq. Bradley Hammers, Cushioned Helve, Upright & Compact

Trimming Presses, \$59% Toledo, Tie Rod, 440-tons; other trimmers 55 to 200-ton Bar Shears, Open & Guillotine, 5%" to 7" Rd. Minster 88-ton O.B.I. Press

Minster 88-ton S.S. Press, 16" stroke Solid Back Presses, 20 to 100-ton #94-A Toledo S.S. Double Crank, Tie Rod

Press; bolster 40x36" Bliss Knuckle Joint Press, 250-ton

Thomas Beam Punch, Ram 32x38"; table 27x46", 300-ton Cleveland EF Sgl. End Punch, 48" throat,

11/4" thru 1" Single & Double End Punches, various throat

depths and caps. L. & A. Multiple Punch, 8', 150-ton L. & A. Multiple Punch, 10', 350-ton Ryerson Serpentine Throatless Shear, 1/2" #416-C Niagara Circle & Slitting Shear, 1/4"

Flanging Machine, McCabe, cap. Bertsch Straightening Roll, 1"x68" Ryerson Friction Saws, #0, #1 & #3 Landis Threading Machine, 1", 2-Sp. lead screw, Lanco Hds., M.D., single up to 4"

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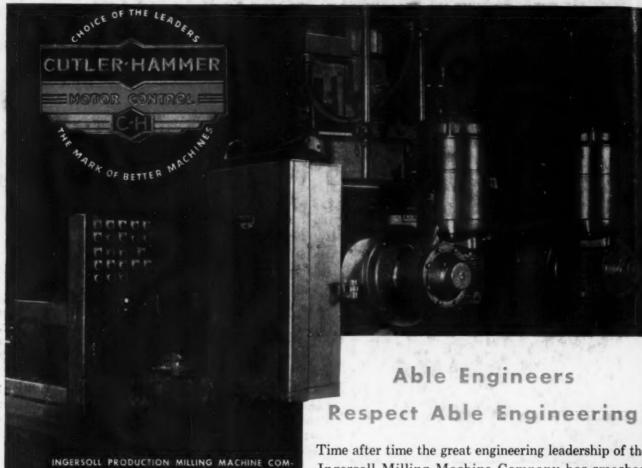
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